Volume 1
Number 2
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A Database Publication

AMIGA COMPUTING



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- Exodus
- Sentinel
- Footman
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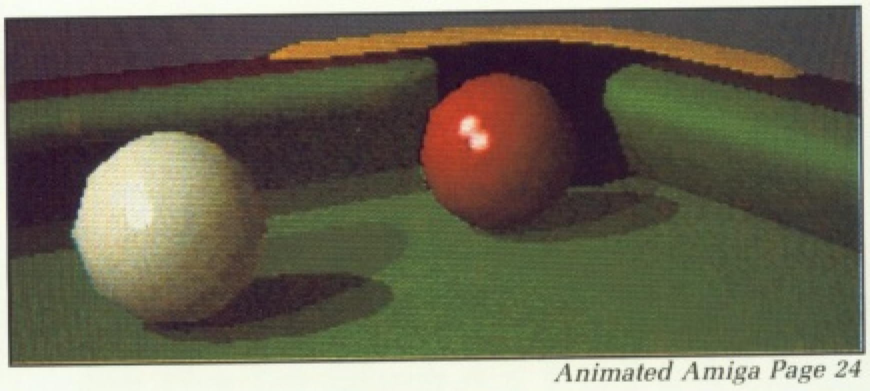
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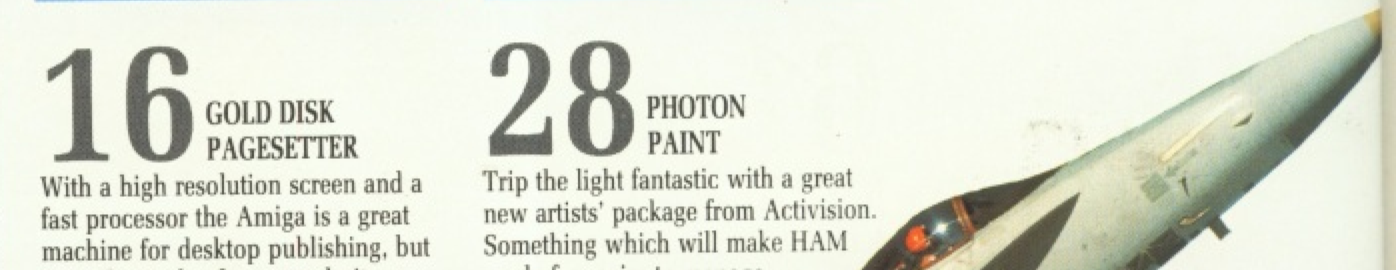
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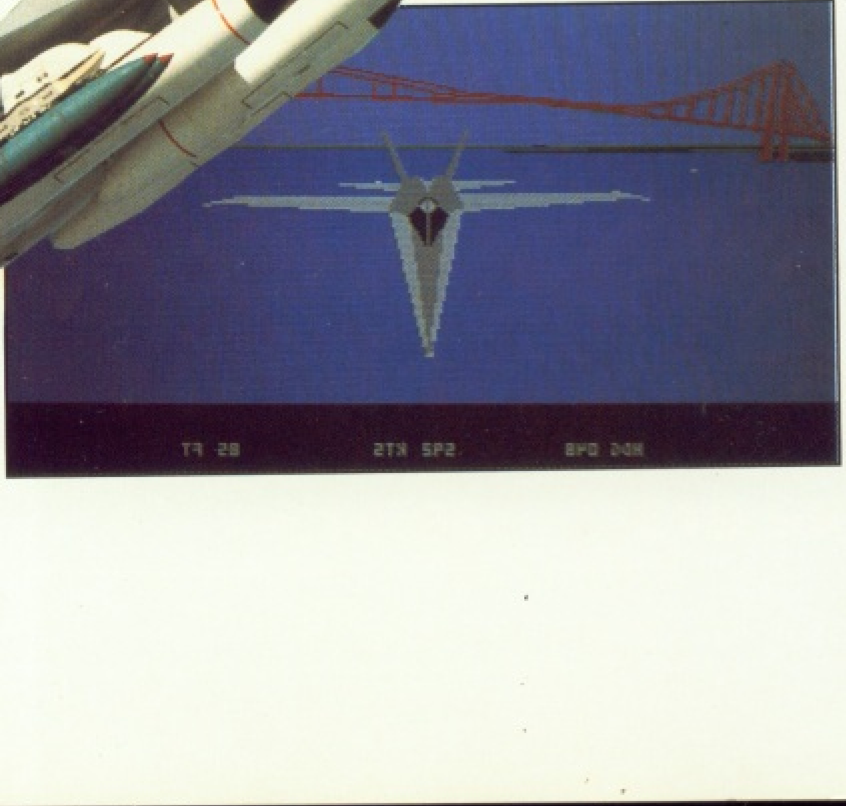
Amiga Computing welcomes articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions can only be accepted for publication by Database Publications Ltd on an all-rights basis.

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AMIGA COMPUTING AWARDS

This month sees the launch of the Amiga Computing Awards. These are given to outstanding products reviewed in our pages. In Olympic tradition there are three types: Gold, Silver and Bronze.

The Silver award is given to a product which offers outstanding value for money. A Bronze award goes to one which is particularly well made or a program which shines.

The supreme Gold award can only be won by a product which is both exceptionally good value and well made.

Very few products will win an award – fewer still an Amiga Computing Gold. Don't expect a Gold winner every month – they will be saved for the cream of the Amiga crop.

Supreme

Excellence

Value



Sample battle Page 39



Electronic Arts Page 36

Link your Amiga to the outside world with...

MicroLink

Electronic mail – The cheapest and fastest form of communication possible. It costs the same to send a message to one mailbox as to 500!

Telex – up with 96,000 telex subscribers in the UK and 1.5 million worldwide. You can even send and receive telexes after office hours or while travelling.

Telemessages – Type in your message before 8pm and delivery is guaranteed by first post the next day (except Sunday), anywhere in the UK and USA.

Tele-booking – Reserve train and theatre tickets, check flight details worldwide, or order from a vast range of products – from flowers to floppy discs.

Advice – on a team of professional, legal and financial advisors as and when you need them, for both business and personal problems.

Company Obtain facts about any British limited company in seconds, and fully analysed financial information on over 100,000 companies.

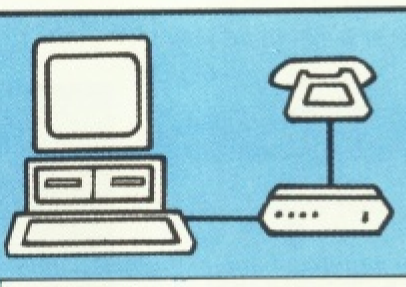
Translation – Access the biggest and most up-to-date multi-lingual dictionary in the world, with over 380,000 words.

News – Use the powerful search commands to pinpoint vital business information from the world's leading news services, newspapers and periodicals.

Radiopaging – If you also have a pocket radiopager you'll be alerted each time an urgent message arrives in your mailbox. So you're always in touch.

Gateways – Get through to New York in just five seconds – or key into the EEC computer in Luxembourg, which links you to 600 databases throughout Europe.

When you join MicroLink you've got the whole business world at your fingertips – 24 hours a day. You'll have immediate access to ALL the facilities offered by Telecom Gold ... and a great deal more besides.

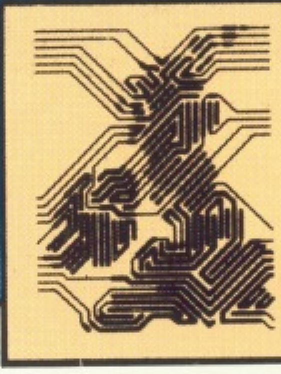


All you need – apart from your Amiga – is a modem, which plugs into your telephone wall socket and suitable communications software.

We have provided a list of possible combinations (left), ranging from the very cheapest to ones which can automatically dial the MicroLink telephone number and connect you directly to the service – all you have to do is type in your personal security password.

Whichever equipment you use, you will be able to call MicroLink, open your mailbox, save to disc any messages waiting for you, and disconnect in as little as two minutes.

	Typical comms packages
A	*Pace: Nightingale V21, V23 manual-dial modem + Rubycomm Software + RS232 lead (£199 inc carriage & VAT)*
B	*Pace: Linnet V21, V23 autodial modem + Rubycomm software + RS232 lead (£257 inc carriage and VAT)*
C	*Miracle: WS4000 V21, V23 autodial modem + Rubycomm software + RS232 lead (£286 inc carriage & VAT)*



More than 90 per cent of subscribers can connect to the MicroLink computer at local call rates.

TO FIND OUT MORE
Fill in the coupon and send it to the address below. You will receive full details of services and costs, together with an application form. Complete this and within days you and your Amiga will be able to use all the services of MicroLink and Telecom Gold.

Please send me full details about MicroLink, and information sheets about the following hardware and software options (please circle):

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Address____________________

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Send to: MicroLink, Europa House, Adlington Park, Adlington, Macclesfield SK10 4NP.

AMC7

AMIGA SCENE

PRICE CUT GIVES AMIGA PARITY WITH ATARI ST

IN a move that has sent shock waves through the computer industry, Commodore has slashed £100 from the price of the entry-level Amiga.

This puts the Amiga 500 – at £399.99 – into direct competition with Atari's 520STFM, which was only recently on the receiving end of a price hike, thanks to the world shortage of dram chips.

And with the two machines competing for essentially the same market, Commodore is confident the Amiga's reputation will be the deciding factor for end users.

On the whole, dealers also welcomed the news. "I was delighted to see prices go up on the Atari", said Steve Kingston of Bath Computer Shack. "And a reduction on the Amiga will make even further inroads for Commodore".

But he had reservations about the long term benefits of price cutting. "I can't see Atari sitting back and doing nothing – there have already been rumours of reductions. But a Dutch auction between the two will make things very lively for the customers".

A Northern dealer had no reservations: "It's just the shot in the arm the machine needs – sales so far have been steady rather than spectacular", he told *Amiga Computing*.

"A new pricing policy, taken with the rapidly increasing software base, makes the Amiga a very tempting proposition – especially when it's measured against the ST".

Surprisingly, some dealers are not particularly happy with the idea. John Daniels of Cut Price Software thinks the Amiga sells well enough on its own merits anyway and that a price war is hardly needed.

"It's a slow seller at this time of the year, but it was ahead of the ST two months ago and will be again", he said. "The ST is a glorified games machine – I have one myself but I wouldn't dream of using it for business.

"There should be a price distinction of at least £100 to reflect the difference in the capabilities of the two machines".

Lurking bandit

YET another Amiga virus has been identified – but finding it is another matter.

Christened the Byte Bandit, the new virus makes its presence felt – after an apparently random length of time – by freezing the machine, corrupting the Workbench and losing any program running at the time.

The net result is that users are returning apparently damaged machines to dealers, and swamping them with calls for reassurance and advice. An added complication is that the Byte Bandit is undetectable by existing Virus Killers, though it can be tracked down with a sector editor.

And users are compounding the problem by unwittingly transferring the hidden virus to uncorrupted discs.

Soft sell to schools

SCHOOLS in Canada are to benefit from a new Commodore marketing exercise which offers them Amiga software at a quarter of list price.

Project Software includes more than 100 educational software titles worth $10,000.

When a school board buys between 3 and 50 Amiga 500s it can get the entire library for $2,500. If an order tops 100 machines then all the software is free.

Canadian schools already get one free Amiga 500 for every two they buy.

Break the bank

NOW anyone with an Amiga can enjoy the thrill of becoming the man who broke the bank at Monte Carlo – and if the winnings aren't real money, neither are the losses.

Casino Roulette from CDS Software (0302 21134) is an invitation to the world of high society gambling for up to eight players at a time.

The program automatically calculates what each player has won and how they stand, and gives a statistical analysis of the previous 370 spins of the wheel.

It also includes six established roulette betting systems. Price £19.99.

MICROLINK HOLDS THE LINE ON EMAIL PRICE INCREASES

DESPITE this month's surprise Micronet/Prestel price increases, MicroLink says it will not be forced by BT into raising its charges in line.

From July 1 Micronet/Prestel subscriptions will go up from £66 to £79.95 a year for home users, with business users paying £119.95.

Peak time charges are to rise from 6p a minute to 7p, and free off-peak usage has been scrapped – users will now have to pay 1p a minute.

For the first time, full peak time rates will also apply on Saturdays between 8am and 6pm.

However, although some communications industry observers are predicting that MicroLink will have to follow suit, the company says its annual subscription will remain at £36 for home and business users alike and it will continue to operate off-peak rates for the whole of Saturday and Sunday.

Head of MicroLink Derek Meakin said: "The increases in the cost of using Prestel stem from pressures that we have been successfully resisting since MicroLink started over three years ago.

"We have rejected all arguments to increase the cost of our services – even when Telecom Gold upped its charges substantially last year we were able to protect our users from their effect.

"As a result MicroLink has grown by leaps and bounds and it is not surprising that our subscribers form by far the largest single group on Telecom Gold".

Protests from comms enthusiasts have been flooding in to Prestel following the announcement of the increases in charges.

Typical Micronet user Dave Gilbert from Derbyshire estimates his average bill would rise by 120 per cent.

He said: "Off peak use of Micronet – 50p an hour British Telecom and the new 60p an hour Prestel – means that as my BT bill is presently £100 from Net use this would make a new cost of £220. "This I could not afford – I would have no other choice but to say goodbye".

Germany's software slow to emerge

GREGOR NEUMANN reporting from West Germany

COMPARED to England, the German software scene is a rather unprofessional organisation. The industry consists mainly of small software companies founded by computer freaks who try to sell products on their own.

The whole German software market is controlled by two major distributors, Ariolasoft and Rushware, who handle products for the big British and American software houses.

Given the lack of German software houses, there has been no strong competition – no one has been able to establish a successful label to become an effective third force.

The lack of German software houses meant a dearth of German software as local programmers felt they had no outlet for their products. In 1983, for example, there was only one small independent company Kingsoft, ranged against the giants.

Kingsoft started with budget software, and has since grown slowly to become the leading label – but not distributor – in Germany. In fact, today the company employs many German software developers.

With the rise of 16 bit computers, notably the Amiga, two more companies rapidly established themselves in the marketplace – Rainbow Arts (Garrison, Bad Cat, Great Giana Sisters) and Micro-Partner (Western Games, Pink Panther). The two companies are backed by Rushware and Ariolasoft, which are now trying to activate German program developers.

Rainbow Arts especially is growing rapidly and has its sights set on becoming the biggest software house in Germany. To this end the company has enticed the best team of programmers – Magic Bytes – away from Micro-Partner.

While this was the first time a label had switched companies, the move has its echoes in Andy Braybrook's decision to work for BT.

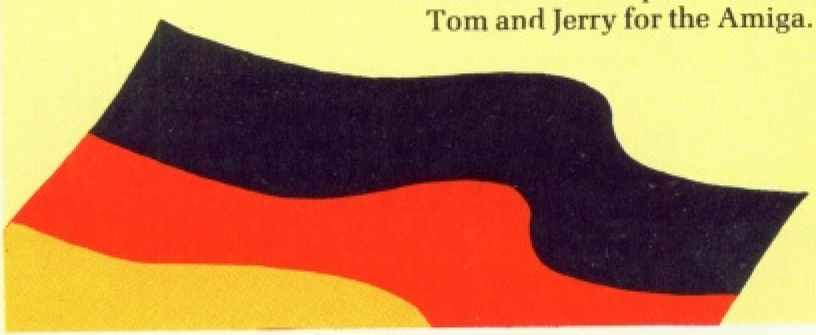
Two questions remain, however: Who owns the programs still under development, and who owns the name of the label?

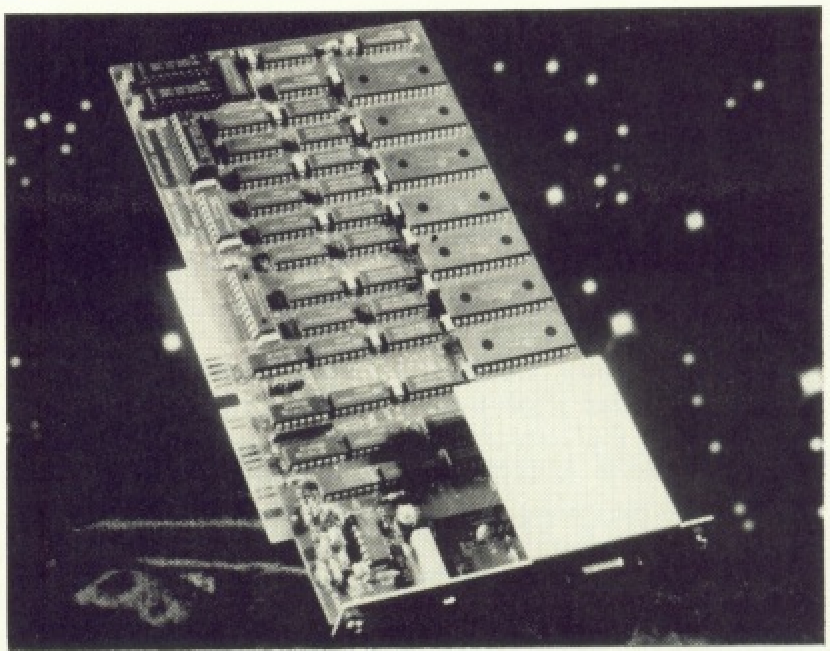
Micro-Partner bought the licence to publish the official Tom and Jerry computer game with the intention that Magic Bytes should write the game. But once Magic Bytes joined Rainbow, no one seemed to know who exactly had the rights.

The confusion was compounded by the welter of contracts involving various permutations between Magic Bytes, Micro-Partner, Ariolasoft, Rushware and Rainbow Arts, and at one stage it seemed that only a court case could unravel the tangle.

In the event, however, a solution was worked out. Both the Magic Bytes label and the licence for Tom and Jerry belong to Micro-Partner – only the programmers switched to Rainbow Arts.

We'll have to wait and see whether Micro-Partner can find new developers to finish Tom and Jerry for the Amiga.





The Microway (Europe) Flicker Fixer Board for the Commodore Amiga

Easy on the eyes

BETTER known for its PC numerics and maths co-processors, MicroWay has entered the Amiga market with the Flicker-Fixer board.

Managing director Simon Shute said: "This is our first ever product for the Amiga, but it fits in very well with our strategy of offering upgrades that make genuinely useful improvements to system performance.

"Previously, Amiga users have had to contend with a high resolution mode that is so bad it almost hurts to look at it. Most users have stuck with the low or medium resolution modes.

"The Flicker-Fixer allows the Amiga to achieve its true potential for display of superb graphics – something it has never done before". It costs £345 from MicroWay (01-541 5466).

Amiga to the rescue

GROWING success of the Amiga is the main factor in Commodore International's third quarter profits of $9 million and sales of $200 million.

In the same period last year Commodore profit was only $1 million with sales of $170 million.

Chief executive Irving Gould said: "We're pleased with the strong performance of the Amiga product line which accounted for 45 per cent of our revenue in the quarter".

Short of ribbons

IT would appear that Commodore can produce a printer – but not the ribbons to go with it. At least that seems to be the case with its latest offering for the Amiga, for owners of the new 1500C machine have been having great difficulty tracking down extra cartridges.

In fact the situation proved too problematic for Commodore – it recommended customers to seek advice from Meedmore Distribution (051-521 2202).

"We have had a number of inquiries from irate 1500C owners wanting printer ribbons", said Meedmore's manager Geoff Hall. "After a great deal of searching we managed to secure supplies from a European dealer.

"One of the reasons for the delay in being able to fulfil orders was that it was extremely difficult to identify the ribbon type", he added.

"However, now that we have supplies the only other hurdle to overcome is the price. At £24.97 each it may seem a little high but we are trying to have them manufactured on our behalf, which should reduce the cost considerably".

Activision becomes Mediagenic

ACTIVISION, one of the best established Amiga software houses, has changed its name to Mediagenic. The Activision name will remain, as the games label, with the re-introduction of the logo which graced the company's early VCS cartridges.

New titles include AfterBurner, which is being forecast as number 1 for next Christmas, Time Scanner – a pinball game, R-type – the latest scrolling shoot-em-up and a number of other arcade conversions.

Mediagenic will explore different markets – and not necessarily computer based ones – with an emphasis on presentation tools and interactive video.

Teletext for Amiga

AN international version of Microtext's Teletext Adapter is now available for the Amiga. The modified product copes with the different television frequencies and standards – which are not compatible with those of the UK – used by various countries.

And in addition to handling these the adapter provides access to teletext plus pictures and sound in any country using the PAL colour system.

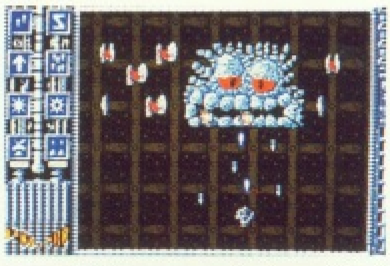
Other facilities, including the ability to save or print pages, allow the user to get more from Teletext. And Microtext (0705 595694) has also included a system to speed up page availability and allow instant recall of the last 16 pages received.

Connected to the computer via the parallel printer port, the Teletext Adapter is supplied as a free standing case coloured to match the Amiga. Price £169.50.

Take over

BETTER Dead than Alien is the name of a the first Amiga game on the new label Electra.

It is written by Oxford Digital Enterprises – ODE – which started the scrolling shoot-'em-up as a spoof, but according to ODE's David Pringle: "The aliens just took



over". The game is described as slime, so you might have trouble holding a copy, and it will cost £19.95.

Bundled software

SERIOUS software at sensible prices should be on the way for Amiga users with a promotion recently launched by Precision Software (01-330 7166).

The company is offering discounted software bundles for a variety of applications. And while the promotion is aimed at dealers, end users too will feel the benefits.

Savings are considerable. The Professional Image Processing bundle – Digipic, PIXmate and Paxall Video Camera – now retails at £499.95: Bought separately the packages would add up to more than £600.

An Introductory Graphics pack – Express Paint, Pageflipper and IntroCAD – is available at £99.95, while would-be sound samplers can get started with Perfect Sound and ECF Mide Interface for £124.95.

The DTP bundle, VizaWrite and Citydesk, is now priced at £149.95. VizaWrite also features in the £199.95 Business Pack, along with Logistix and Superbase Personal.

Precision's 250-plus dealers will have the option to sell the bundles intact or split them, and the promotion will be backed by an extensive advertising campaign.



Picking software and countering the virus

JIM BUTTERFIELD reporting from Canada

THE Amiga has acquired a respectable number of serious programs. In North America, Commodore did its bit to give the software industry momentum by sponsoring a promotional deal for user groups.

The deal tied together new users, user groups and software houses by making a bundle of programs – home or business – available at an attractive price to system purchasers. The offer put a lot of professional level software into user hands. And since one of the most important buying-decision questions is: "Who do I know who has it?", a lot of good programs developed a credibility base.

Deluxe Paint II leads the field of drawing programs. WordPerfect is undoubtedly the most revered word processor. SuperBase, from Precision Software in the UK, is highly rated for database applications.

There's no clear winner in the spreadsheet race, but MaxiPlan was part of the Commodore promotion and seems to be well regarded. In other areas – sound, animation, communications – the best package may be the one that fits your particular needs, budget and hardware configuration.

On the non-commercial side, group librarians find themselves swamped with free programs. In the early days of computers, the questions was: "Where can I find ANY programs?" Today, the Amiga question is: "How can I pick my way through the huge mass of free programs?"

Free, or almost free programs come in three classes. The legal interpretations vary. Public domain programs are common property; you may give them away, sell them, copy them, change them, or feed them to your budgie.

Free distribution ones may be copied and given away, but not sold or changed. The author retains copyright for legal purposes, and often insists that a program may be copied only if accompanied by full documentation.

Shareware programs are those where the author hopes that the user will send money. The last have been of only limited success

The free program distribution system is one of joyful turmoil. The telecommunication networks buzz with new versions of products, questions, boasts and rumours. But there is fear of the dreaded virus.

Commodore has a team – CATS – whose task is, in part, to track and counter viruses. And a separate group is developing a reward fund to help locate and prosecute virus-creators.

I'm not sure about the prosecute part; apart from the legal side, can you effectively sue someone who has the mental maturity of a four-year-old?

Deeper into space

STAR Wars the movie eventually spawned Star Wars the coin-op for Atari – and Domark's bestselling conversion for the Amiga.

Now Domark (01-947 5622) is following up its success with the release of The Empire Strikes Back, a one-player game which bears more than a passing resemblance to the movie.

The player controls both Luke Skywalker's snow-speeder and Han Solo's Millenium Falcon



After Star Wars Luke Skywalker takes to space again courtesy of Domark's The Empire Strikes Back

Conversions lining up

IN a determined bid to set its stamp on the 16-bit market, Ocean Software (061-832 6633) has more than 20 products due for release over the next few months – and a sizeable proportion are destined for the Amiga.

Jackal and Gryzor are in the pipeline, as are Platoon, Army Moves, Green Beret and Combat School, all established favourites in othere formats with armchair warriors.

Strong Amiga showing at Comdex

BY JOHN FOUST*

COMMODORE made a strong showing at the recent Comdex show in the USA when it unveiled a number of Amiga add-ons.

The twice-yearly Comdex presentation is aimed at Commodore dealers and value-added retailers, the main attendees.

Commodore's presence is as much for sales as for public relations – and does wonders for boosting and maintaining the company name in the minds of professional computer buyers. An appearance is an expensive proposition, but it pays off in many ways.

The show, held in Atlanta, Georgia, drew a record 60,000 visitors.

Much interest was shown in the new Commodore products, although no indication was given of prices, nor when they will become available.

The only surprise was a 20Mb SCSI hard disc for the Amiga 500, with sockets for 2Mb of additional memory in the expansion box.

The other products had been previously hinted at to some extent – an expanded Chip memory graphics chip set, a 640 x 400 non-interlaced display chip set, a Commodore bi-sync monitor to work with the non-interlaced display, the new AmigaDOS 1.3, and the 68020 coprocessor board, with and without Unix System V, release 3.2.

Aside from a modest booth on the trade show floor, Commodore held a press and dealer event in two ballrooms at a nearby hotel. One ballroom held about 125 Amiga 500s and 2000s while the other housed a large projection television screen and several Amigas for the various presentations.

After a series of enthusiastic speeches from Commodore management, musician and programmer Roger Powell gave a performance of Amiga Midi music, using his Textures program.

Los Angeles artist Brummbar was also on hand, showing the animations and still images he makes with VideoScape and paint programs. Commodore printed a poster with a montage of his images, which Brummbar autographed.

Brummbar works with celebrity Timothy Leary – now a figurehead in the science fiction cyberpunk movement – making animations and images for promoting Leary's recent books.

Pro image

APART from the creative and entertainment potential of the Amiga, it was clear that Commodore is hell-bent on cultivating a professional image for our machine. Most Amigas in the Comdex stand had FlickerFixer boards to avoid the annoying inter flicker, so the Amiga displays were indistinguishable from the other EGA-style displays at the show.

Presentations

THE Amiga 2000 can attract IBM PC compatible buyers. Many corporate purchasing departments require an IBM PC compatible machine, and the Amiga 2000 is a way to get the IBM compatibility along with the video presentation abilities of the Amiga side. In this way, Amigaphiles can sneak the 2000 into a company to do presentation graphics, while retaining the ever-popular PC compatibility.

One example of a professional application was Commodore's Professional Video Adapter, or PVA. The PVA includes a digitiser and two-source switchable genlock. It was shown connected to a video camera attached to a microscope. Microscopic organisms swam on a slide, and the PVA digitised and genlocked their image.

On the tail of recent announcement of the Amiga 2500 AT and UX machines, another part of the Commodore stand showed the 68020 co-processor running Unix.

Several weeks ago, a debate ensued as to whether the Amiga 2500 would ever be released in the US.

In a Wall Street Journal interview, CBM chairman of the board Irving Gould said that the machines would be sold in the US. Within days of this interview, several other Commodore upper management members denied this.

While the 2500 machines are actually composed of off-the-shelf Commodore boards, availability of the Unix software is a key problem.

Chances are, if the software is available in the US at all, it will be sold only through a few select dealerships that can handle the extra level of support necessary for the complex Unix operating system.

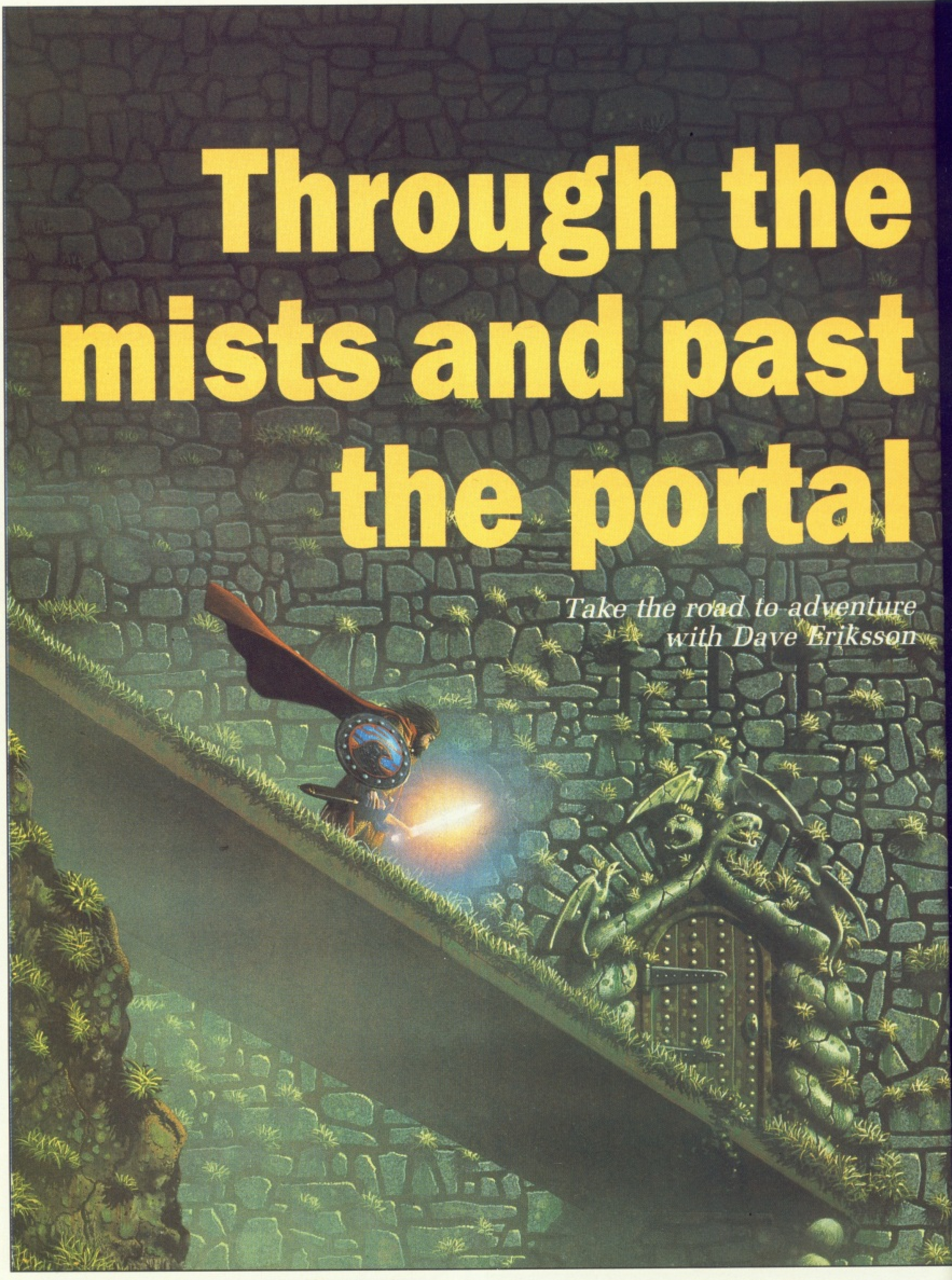
The 68020 board's Unix was demonstrated running a proprietary windowing interface. Most probably, the Unix will be shipped with Commodore's version of the X-Windows windowing interface.

One Commodore engineer was willing to talk about a recently developed 68030 coprocessor board for the Amiga 2000. It runs at 25 Mhz, but it has not been officially acknowledged in any way.

**John Foust has been an Amiga writer and Amigaphile since Day One. He has regular columns in several US magazines.*

Through the mists and past the portal

Take the road to adventure with Dave Eriksson





THE original Adventure game appeared in the mid-seventies and was to be found on many mainframe computers. For all its success, there were some who wanted to see an improved operating system, as Adventure only accepted a simple showing each character's status. This

In 1977 a group at the famous Massachusetts Institute of Technology developed a new parser that would understand commands like: KILL TROLL WITH SWORD, OPEN GREY BOX and GET ALL BOOKS EXCEPT THE RED ONE.

The first game to use this was Zork. Originally developed on a Dec 10, it was later converted for other computers but in each case required a memory of megabytes rather than kilobytes. With the rise of the micro, the operating system for Zork was rewritten in ZIL, Zork Implementation Language. The saving in memory was fantastic.

Presently Infocom has games for most tastes but recently discontinued production of over half of the Amiga titles. Some are real classics and should be in everyone's collection. If you act quickly, at least one mail order house has many for only £12. Buy now, I'm sure you'll not regret it.

APART from its parser, the main feature of an Infocom game is the highly descriptive text. Although complex commands are possible they require the first six letters of a word to be typed in, rather than the more usual four. Infocom games are as good as anything else on the market, but I feel that we should not be blinded by hype. I wonder how many players actually type in TAKE EVERYTHING EXCEPT THE BLUE BOOK, rather than TAKE ALL, followed by DROP BLUE BOOK.

Underground Zork 1 is a great adventure. Of all the early Infocom offerings, this is the one for the beginner. It is not easy, but is fun and brings a great sense of achievement when you win through each puzzle.

Also known as The Great Underground Adventure, Zork 1 starts outside an apparently deserted house in the middle of wooded country. The entrance to the underground domain is in the house, but the countryside around also has hidden treasures. Your prime aim is to gather treasures and put them in a trophy case.

Drawing a map as you go is vital but complications arise when exploring the two mazes. The standard method to map a maze is to drop objects so you can identify a location when you go back to it. However there is a thief roaming around, so objects dropped may not be there when you return. You will meet other characters, some of whom you will have to fight. This was a first for the original Zork.

DIAGNOSE will display your state of health and, if wounded, the number of turns to full recovery. The location descriptions are very colourful and you may choose their length with VERBOSE, BRIEF or SUPERBRIEF.

There is the unusual option of being able to ask questions with commands such as WHAT IS XXX? or WHERE IS XXX?. You may not always get a useful answer.

Try asking WHAT IS A GRUE? Grues are Infocom's own special nasties that will grab you if you stay too long in the dark. A battery operated lantern is found in the house. Use it with care, as batteries will not last forever. There are matches, candles and a torch so, keep your eyes open for sources of light.

The underground system is not a natural cave system as in the original Adventure, but is created by a mixture of magic and really high technology. You will come across a hi-tech dam, a coal mine and the entrance to Hades. This game is devious; watch your score closely to see how well you are doing.

Do not take too much underground to start with; you will not be able to carry many treasures back to that trophy case. You can find several weapons, some of which are more effective than others. Read books very carefully. Remember that they may have more than one page, and SAVE your game position before pressing any buttons.

If Zork is a classic text adventure, then Exodus: Ultima III has got to have a similar standing in the field of computer role playing games (CRPGs). It is produced by Origin Systems and distributed in the UK by Microprose.

NOT surprisingly, Ultima III is the third in a series of CRPGs. I and II are not available for the Amiga, but IV should be here any time, and V is in the final stages of completion. Several early CRPGs gave you the option of assuming the persona of various different classes of character – fighter, cleric or magic user and so on.

Ultima III was one of the first to enable you to venture forth with three companions, each having attributes and characteristics of their own.

The underlying plot of the Ultima series is the rise of evil in the land of Sosaria. Called through time and space by Lord British, your mission is to gather a team of adventurers to defeat its present manifestation. Although the setting and weapons are ▶



Escaping from monsters near a small town the party's ship is engulfed by a whirlpool



Fighting goblins on board ship



Fighting a group of renegade wizards

◄

mediaeval, there are hints that this civilisation is on the downward spiral from a past that knew much more.

The spawn of evil from the past overshadows any other concern, as you and your team struggle to unravel the clues to its existence. Origin may not produce the cheapest games on the market but its standards of quality and presentation are of the highest.

Ultima III comes with a cloth map of Sosaria and three manuals. One is general and the other two describe the various priestly or sorcerous spells your characters may use. A simple reference card covers all the options open to the player.

Before wandering into the wilds of Sosaria you must create your characters – up to 20 – and form a party. You can go adventuring with less than four but this is not wise. In creating each one, you must choose the name, sex and race (human, elf, dwarf, bobbit or fuzzy). Each race has different potentials – dwarves are strong, elves are dexterous and so on.

Next comes choice of profession – barbarian, thief, wizard or ranger. There are 11 possibilities and care must be taken to finish up with a balanced party. Finally you have 50 points to apportion for your characters' strength, dexterity, wisdom and intelligence.

Fighting types need strength, thieves dexterity, clerics wisdom, and magic users intelligence. A table in the manual lists the professions and tells you what type of armour, weapons and spells each can use.

A good combination to start with would be ranger, thief, druid and wizard, providing good fighting ability and characters who can cast healing and offensive spells. You are now ready to journey into the unknown lands of Sosaria. The wind in your hair, open rolling plains behind you and a small walled city before you.

THE display is a plan view, with one character indicating your party's position. Water is shown to the right of the map and two buildings represent a castle and small town. You can see some woods to the west.

To the right of the map is a display showing each character's status. This provides such information as food supplies, hit points, magic points (spell casting ability) and their level (all start at level 1). By typing Z, you are told how much gold they have, what they are carrying and their present statistics.

Each character starts with a dagger and cloth armour, but you must tell them to 'R'eady the dagger for use and 'W'ear the armour.They have a limited amount of gold. The sensible thing to do next is 'E'nter the town to buy additional weapons and armour. Visit the tavern where gossip may be heard, or bought for the price of a few drinks.

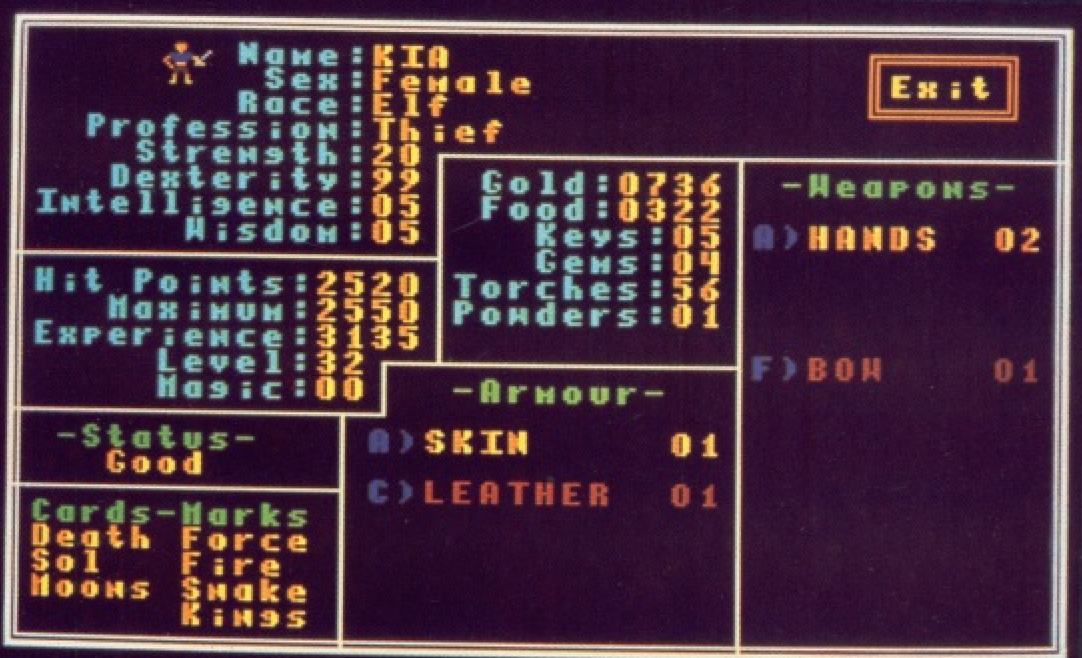
Most towns have a grocers for food, and some other interesting places. Explore towns carefully and talk to the people – you will pick up all sorts of useful information. Purchase a bow, even if this means pooling your team's gold.

Out in the open, everything that moves will attack you. If you can kill some of them before they can get to you, it will save some hit points. Kitted out to the limit of your purses, leave the safety of the town. Monsters come in a variety of different guises, from orcs, trolls, ghouls, zombies and giants, to daemons, dragons, devils, balrons and even sea serpents.

When combat takes place, the display shows a larger scale map, with the four members of your party towards the bottom and the foe towards the top. Once conflict has begun there is no retreat.

Battle at a distance is possible with a bow, magic or by throwing daggers.

Your team may only swing or throw weapons to the north, south,



Status screen for one of the team

west or east, and the enemy may also strike on a diagonal. Each time a member of the team is hit his hit points decrease.

ONCE past the initial stages, I found the combat and magic balance one of the best I have come across. Every time a member of your party kills an attacker, he gets additional experience points.

Initially, for each 100 gained, Lord British will increase your potential hit points. Time ticks away inexorably but the game's pace is quite acceptable. You may pause to take breath and consider your options by selecting to use a weapon and then delay in aiming it.

Having won, the vanquished foe leaves behind a treasure chest. These are often booby-trapped, but may be opened safely using a priestly spell. Thieves may be used as they are more likely to spot traps.

If it has been a costly battle do not hurry to open the chest as a spot of healing may be worthwhile. You can use chests as a barricade to protect your flank. Hit points lost during combat will come back as time passes; the same goes for magic points expended in casting spells.

Many towns are dotted around Sosaria – explore them carefully to find out what and who they contain. In some places injured or poisoned characters may be healed – for a price. Keep a pencil and paper handy.

Dungeons are 3D mazes. The four keys that you've been using to move N,S,W,E now refer to forward, retreat and turn left or right. Dungeons are dark. Spells will light your way but last only a short time, so you are better off with a torch. These and other useful items may be purchased from guild shops found in some towns. Initially only a few spells are available to you as their use depends upon the number of magic points a character has. When creating a magical or clerical type it is wise to allocate the maximum number of points to the appropriate attribute.

As you explore coastal areas, you may find yourself under attack from a pirate ship. If you beat the pirates, the ship is yours and you can explore Sosaria more thoroughly. There are many pirates at sea, so be prepared to meet them either with cannon or a boarding party.

Another means of travel is via Moon Gates, ancient structures which only appear at certain phases of Sosiria's twin moons. Entering one will teleport you to another gate. To help you to understand the working of these portals, the phases of the moons are included in the main display.

Exodus: Ultima III presents a real challenge and has much more to it than just bashing monsters. There are 26 commands issued with a single letter input – the mouse duplicates some of them. There is an option to type in additional commands such as DIG or SEARCH. It is not too difficult to learn to stay alive, but solving the real puzzles behind your quest will take a little longer.

REPORT CARD

EXODUS: ULTIMA III
Origin/Microprose
£24.95

STORY LINE
Believable alternative universe in need of help. You'll want to give it.

AURA
Creating and believing in your team of characters is a simple part of the fun.

STAYING POWER
Will take you many enjoyable weeks to map and to learn its hidden secrets.

GAMEPLAY
Well balanced operating system that makes the whole thing hang together.

VALUE
Must work out at fractions of pence per hour of pleasure, despite the high American price on the shiny box.

DIFFICULTY
Stamina needed to explore and map all of its many levels. Worth the effort.

OVERALL *58%*

Winner for role players, lots to get your teeth into. Totally absorbing.

REPORT CARD

ZORK
Infocom 01-431 1101
Less than £15

STORY LINE
Archetypal fantasy with enigmatic origins of underground empire only apparent after quite some time.

AURA
Good descriptive passages keep the interest active however often you play.

STAYING POWER
Lots of puzzles maintain pressure to keep you up until the small hours.

GAMEPLAY
Basic text adventure with many good puzzles and mazes to tax the player.

VALUE
Excellent. Just because Infocom has stopped producing the game it is now sold at bargain prices. Buy quickly.

DIFFICULTY
All Infocom games involve some devious thought. This is a good place for the novice to learn the ropes.

OVERALL *64%*

Does not show its age. A game with heritage, which has sired many more adventures, including Zorks II and III.

Making the headlines

John Walker looks at Gold Disk's DTP package

THE Amiga lacks a top-class desktop publishing program to rival Aldus PageMaker on the Macintosh or Xerox's Ventura Publisher on the IBM PC. But, a little lower down the scale, it can compete with other computers.

Of the DTP programs available, the deservedly dominant one is Gold Disk's PageSetter. This really shines when used with PageSetter LaserScript, a good PostScript driver for an appropriate laser printer such as Apple's LaserWriter.

PageSetter is capable of producing work of a professional quality, although this requires considerable effort. It is used to produce the American magazine Robo City News.

With it, I typeset and illustrated a 150-page book – The Desktop Guide to Desktop Publishing.

You can create school magazines, club bulletins, community newsletters and flyers. For such productions, you will hardly notice that it has no automatic page-numbering or that it lacks such typographic niceties as automatic hyphenation (splitting words at the correct point when they are set in columns) and kerning (altering the amount of space between adjacent letters).

PageSetter comes on a single unprotected disc together with a small and inadequate manual. This raves about the joys of desktop publishing but fails to tell you everything it should about the program.

WHERE PageSetter differs from many desktop publishing programs is that it allows you to switch between three screens – the page layout screen, a text editor, which provides many of the facilities of a word processor, and a graphics editor which doubles as a simple drawing program.

The text editor allows you to copy, cut and paste text, to search for words or phrases, and replace them. But it is line- rather than page-orientated, which makes updating the screen somewhat jerky. I found it too uncomfortable to use as a word processor.

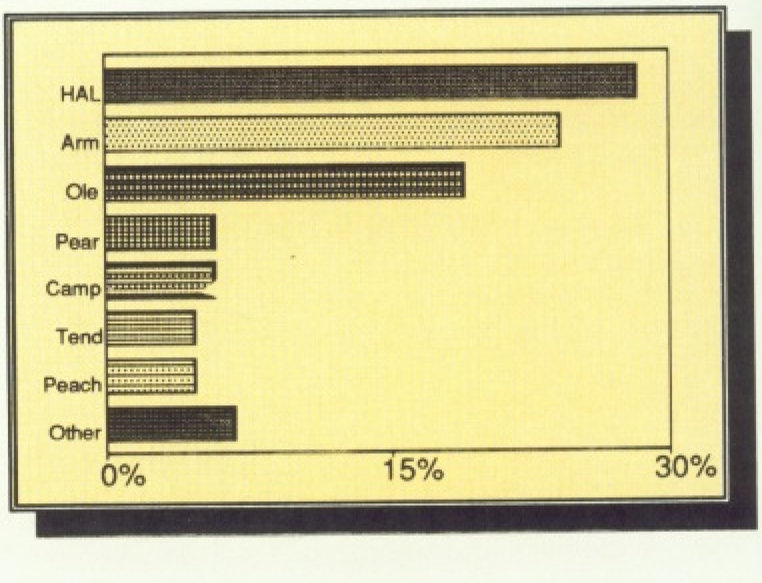
The text editor's main purpose is to fine tune words created on another word processor. You can load documents saved in Ascii. PageSetter is also compatible with Scribble! and Textcraft, so it will preserve styles, such as italics, from the original document.

You set different text styles within the editor by entering a backslash followed by the appropriate letter around words or phrases. Thus, \b would put words that followed it in bold and \n would return them to normal. Available styles are bold, italic, normal, outline, reverse, shadow and underline, which can be mixed in any combination.

The graphics editor is used for loading and altering illustrations. You can draw lines in various thicknesses, airbrush, and produce filled or outlined rectangles and circles. A zoom gadget magnifies part of a picture so that you can add fine detail.

You can clip part of a picture and use it as a brush. The artwork can be copied, re-sized and flipped horizontally and vertically. You can also play around with text, changing its size and shape to create interesting effects, something that the manual fails to tell you.

PageSetter converts colour graphics to monochrome, adding grey scale shading that is sometimes unpleasant. It may also distort the original, since



A simple bar chart can enhance the appearance of a page

GET IMPACT INTO YOUR HEADLINES	Get Impact Into Your Headlines
Get Impact into your Headlines	Get impact into your headlines

Four styles of headline settings. Current practice favours the lower case approach

its resolution of 640 x 200 pixels is non-standard.

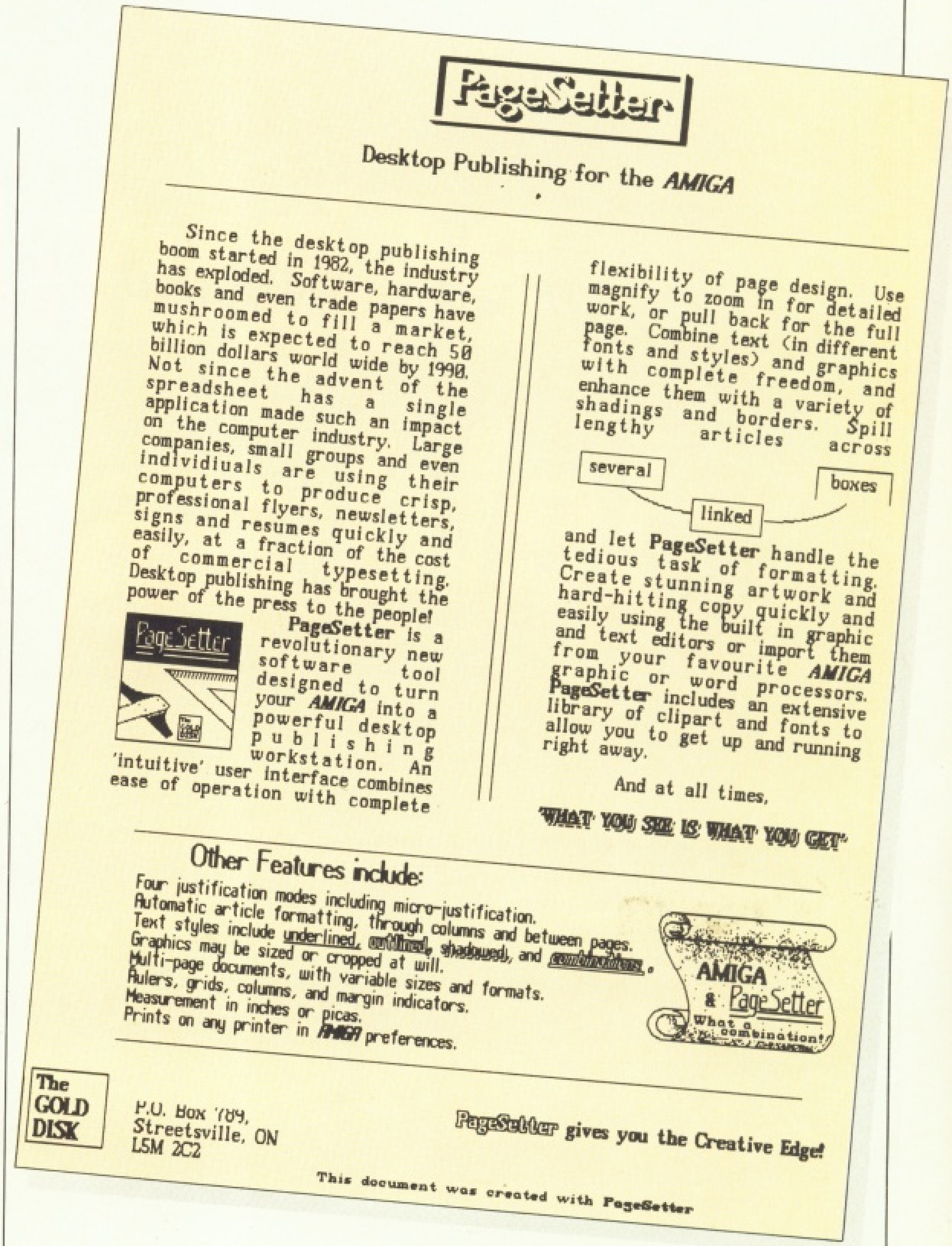
PageSetter's greatest limitation is that graphics cannot be re-sized on the layout page. A full-screen illustration in the graphics editor shrinks to something much smaller, less than a 4 x 3 inches, when printed. It can be shifted, moved at a pixel at a time and masked to show only part of it but it cannot be made any bigger.

INCLUDED on the PageSetter disc is a selection of clipart to provide you with instant illustrations. It is uninspired and uninspiring stuff, but occasionally useful.

You can move text and graphics between the layout pages and the editors at any time. Transfer from one screen and another is almost instantaneous even when there are a lot of words in the system. Using a 512k Amiga I've worked on layouts that ran to 17 pages, contained 6,000 words and half-a-dozen illustrations without much slowing down. You couldn't do that on an IBM PC without a hard disc.

The page layout screen is the heart of PageSetter. To create your layout you use the mouse to access pull-down menus at the top of the screen and a toolbox at the righthand side. The display initially shows a blank page with on-screen rulers.

Measurements are in either inches or picas, that peculiar printing measure with six picas to the inch. In order to make design easier, a grid can be superimposed on the page.



WORDS and pictures are held in boxes which can be drawn on the page or defined in a page requester that allows you to enter the size of the page and its margins with the number and size of the columns, after which they are drawn automatically.

You can define a default box, in which you specify how the text is to be justified – either centered or set ragged left or right, the tracking – spacing between letters, and leading – the spacing between lines.

You can choose a font and whether the box is to have a border around it. There is a choice of five borders, all combinations of straight lines. A shadow can be added to the box.

One minor bug is that PageSetter will not print the righthand shadow of a box unless there is another box beneath and to the right of it.

Boxes can be linked so that text will flow from one to another, over as many pages as you like. Changes to the text in one box will affect all of them. This is useful because it means you can produce a basic layout for a regular newsletter, which can be saved as a series of empty boxes. Then, when occasion demands, you load your text and pour it through the pages.

Boxes can be overlaid, either so that what is in one box will show through another, or in an opaque form, so that you can cover up mistakes. Using the see-through option allows you to put text over shaded boxes or graphics.

A box can be changed in size and shape by simply pulling at its bottom righthand corner. It can be shifted around the page by putting the cursor within it and moving the mouse.

The page itself can be displayed at three magnifications. At its smallest, the whole page is shown on screen. At its second size, you can see half a page on screen at a time. At full magnification, which shows an eighth of a page, what you see will be what you get when you print.

PageSetter uses the Amiga's built-in ▶

◄

fonts, which are acceptable for the main text but don't make good display types for headlines.

Headlines themselves can either be written in the text editor and then added in their own boxes or written on the page using a small pop-up QuickText box in which you can type up to 100 characters.

If you want more interesting typefaces, you will need to invest either in one or more of the three volumes of Zuma Fonts or the cheaper three volumes of Earthbound



PostScript lets you manipulate images, reducing and angling them

PAGESETTER uses the Amiga's Preferences drivers for its printed output. This is a pity since the 1.2 drivers are limited to 9-pin dot matrix printers and some do not work well, leaving thin white lines. The improved Workbench 1.3 drivers cure this, but I'd like to see some custom printer drivers, incorporating the sort of smoothing algorithms which are available on DTP programs for other micros.

Some problems may be solved by a page-printing program included on the PageSetter disc. To use it, you first save your pages, quit PageSetter, load the printing program and print them. Because it occupies less memory, the program holds a whole page at a time in ram, which eliminates the white line problem. A further program included allows you to save a page as an IFF file which you can then load into Deluxe Paint or a similar graphics package.

It takes about five minutes to print a page using a dot matrix printer. The results are good with a 9-pin printer, but better with a 24-pin using a driver from the 1.3 Workbench preferences which is beginning to appear on the updates to some programs – mine came from ProWrite 2.0.

PageSetter LaserScript, an extra program that is an essential buy for those who want the best possible results, allows you to drive a PostScript laser printer. It comes with four PostScript type-faces – Courier, Helvetica, Times Roman and Symbol – which can be scaled to any size you want. It also permits the manipulation of finished pages, which can be shrunk, rotated or laid one or top of another to create unusual effects.

I FOUND the program robust and unlikely to crash. However there is one annoying little bug. Sometimes, when dealing with long documents, the first line on a page will not justify to the lefthand margin but will be set one character in and will resist all attempts to change it. I found the only way to deal with it was to go to the first page of the document, switch from the layout screen to the text editor and then return to the layout.

Otherwise PageSetter is a good, uncomplicated program suitable for non-professional use. I prefer it to such rivals as City Disk and Publisher 1000, although its supremacy may be challenged soon.

The others are being updated, and there are newer ones on the horizon such as Publishing Partner Professional and Gold Disk's own Professional Page. In the meantime, PageSetter provides excellent value for money and will more than meet the requirements of many users.

REPORT CARD

PageSetter
HB Marketing. Tel: 0895 444433.
£79.95

USEFULNESS ....
Turns simple documents into professional looking pages but takes some time.

EASE OF USE ....
While the commands are not immediately obvious they can be picked up quickly

INTUITION ....
Fully intergrated along Commodore guidelines but is ram and processor hungry.

SPEED ....
Professional results take a while but with the Amiga's horsepower it should not be quite as slow as it is.

VALUE ....
At only £80 this is priced much more keenly than you would expect for an Amiga package which has a small market.

OVERALL ***66%***

A full Desktop Publishing package PageSetter takes some mastering but produces creditable results.

Amigas scramble!

Roger . . . Wilco . . . Simon Rockman is cleared for take-off



Supreme

ONLY the Amiga makes it possible. It's Commodore's slogan, and so often a true one. But games software houses with an eye to the quick buck so often let the machine down. Electronic Arts has hung in there supporting our machine since the days of prototypes, so it is fitting that the company should have produced the greatest ever Amiga program.

F/A 18 Interceptor is a flight simulator – that's a bit like saying that Buckingham Palace is a house. True, but an understatement. You are given a choice of the land-based F16 or carrier borne F/A-18 jets to play with.

As soon as you unwrap the program you know that you've bought something special. The documentation advises that you disconnect a second drive on an 512k machine, grabbing the precious ram that it needs. The carrier icon appears. Anticipate blast off. Double click to load and a pilot launches into the blue.

The Amiga drive does its stuff far too slowly, the seconds stretched by ▶

your impatience. The title screen captures the atmosphere of the battle. Two jets locked in a dogfight over a crystal clear Californian sky which contains the kinds of blues you only see in real life and the Amiga palette.

You've plenty of time to appreciate it as the game loads, but that period would be better spent reading the manual. Electronic Arts – EA to its friends – is hardly known for skimping on documentation. The confrontation on your retina is complemented by similar aural stimulation thanks to Dave Wahol's sound.

F/A 18 Interceptor is a game of missions, but before you can take those on you need to learn to fly the crate. The game is its own trainer. The demo mode shows what can be done. Simple options to take off and fly around familiarise you with the controls.

A special mode tests your ability at some set manoeuvres. An instructor goes through a prescribed set of loops, turns and rolls. You have to follow in a chase plane. If you can do this then the next stage should seem easy. Take off from the carrier, climb to at least 10,000 feet and then land back on the carrier.

You have an incredible amount of power in your engines. Thrust can be controlled in 10 per cent increments by using F1 to F10. Pressing F1 when the engines are at 10 per cent will switch them off – something best done when you have landed – pressing F10 when you are at 100 per cent turns on the afterburner, giving you an unbelievable boost. More gentle, 3 per cent, increments of thrust can be selected by using the equals and minus keys.

The best tactic for take-off seems to be locking the brakes and switching to at least 90 per cent thrust. Allow the power to build, and then release the brakes. This ensures that you have enough oomph to stay in the air when you run out of carrier. Lift the undercarriage as soon as you take off – it reduces drag significantly. Resist the temptation to bank.

Climb a little, say to 1,000, feet and then level off. The crosshair in the head up display (HUD) should be one pixel below the horizon. Check the altimeter to make sure you are keeping a constant height. Then use the rudder, the < and > keys, to turn. If you are not climbing or diving the horizon will remain level.

Keep an eye on the compass. From an initial starting position of going north it should rotate to pointing south. If you flip to the map the carrier looks to be lying east-west. That is because it is too difficult to draw it north-south and still look like an aircraft carrier.

While you are travelling south pull back on the joystick and climb to at least 10,000 feet. Then push gently forward, drop the nose a little way below the horizon. Reduce thrust so that things will happen less rapidly and descend to less than 4,000 feet. Switch the radar from its 40 mile limit to 10 or 2 miles, just enough to keep the carrier in view. The further you are the easier things will be later. Level off and use the rudder to complete the circuit. Again it should be possible to turn without banking.

Once you are pointing north dip the nose. The carrier lies ahead. Use the zoom function to make sure that the blob is the carrier and prepare a steady glide path. Drop the thrust to between 30 and 40 per cent.

As you approach the carrier an enemy fighter may attack. It is possible to pull up and spot it without banking. Hit Return to select a heat-seeking missile. Target the bandit. The HUD will light up like Blackpool Illuminations. Once the commie is vignetted by a large diamond, squeeze the trigger. This will loose an air-to-air missile. Fire and forget.

Bring the nose back down to point



Overshoot the carrier and loop round to land



Certain death as you dig a hole in the deck

INTERCEPTOR was written by Bob Dinnerman. It is his first commercial home computer game and the Amiga his first home computer.

No one, not even a genius like Bob D., picks up enough programming experience to produce a game of Interceptor proportions in the year and a half it took to write.

Bob used to be a programmer for Bally – the arcade game manufacturer. He wrote the arcade smash Discs of Tron, which despite hitting the arcade market in mid nose-dive still took a lot of money.

Discs of Tron used a mere Z80 with 56k of rom. So it is not surprising that Bob has worked such wonders with a 68000 and half a megabyte. Some of the work, mainly flight algorithms, for Interceptor was a development on a flying game which Bally planned and scrapped.

Bob had not bought a home computer before the Amiga because he felt that nothing could provide the speed and graphics he wanted. Nigh on 90 per cent of the program is written in assembler, with menus and set-up routines in C. The program was developed on Electronic Arts' Artists Work Station (AWS).

It is a shame that Bob's next game is for the PC, but he hopes to return to the Amiga after that. He claims that Interceptor II would be easy with new missions, locations and different planes.

The existing planes were carefully chosen. The F/A 18 because it is new, exciting and carrier-based. It was also chosen because it is a single pilot aircraft.

The F16 was chosen "for variety, and because I have a couple of F-16s in the game trying to defect I thought I'd let you fly one", says Bob.

The Amiga needs more class programmers like Bob Dinnerman. Interceptor is the first of a new generation of Amiga programs.



The game has an accurate map of San Francisco

at the carrier and lose any extra height rapidly. The deck is 145 feet off the sea. You want to be 100 feet above this as you come in to land. While you are still some way off, lower the arrestor hook. This catches wires on the deck surface and hauls you in to land.

Closer in, drop the undercarriage. Then put on the brakes. This not only locks the wheels but engages the air brakes. As you fly over the carrier bring the nose down and cut the engines. You should plop on to the deck. Bring the nose up in a controlled stall to land on the rear wheels.

Real carrier pilots come in at full flying speed in case the arrestor hook does not catch. You shouldn't worry about this. Overshooting is a much greater danger. Your reward for the task is a pair of sweaty palms and the right to go on to a mission.

Now you have proved that you have the right stuff you can take on the world. The first mission is to fly out, identify an enemy plane and fly back. Easy and boring, it is the kind ▶



Pull up! Pull up! Pull . . .

of mission that Nato pilots do all the time. The temptation to blast the foe is dreadful. Don't do it.

The first mission where you are actually supposed to shoot something down offers an enemy plane which is after the President's jet, Air Force One. Succeed and you are presented with a great graphic sequence of AF-1 landing.

Other missions have you trying to persuade two defecting F-16s that they really love mom, apple pie and the American way enough to turn around and not defect. You have to fly in front of them – failing that you can blast them. All the while a couple of Migs are out to get you.

It was while I was just about to talk an F-16 around that a Russian missile homed in on me. I pressed F for flare, C for chaff and E for electronic counter measures. What I really wanted was J for electronic jammer. Instead I got E for eject. At least the missile didn't get me.

The enemy gets harder to attack – a cruise missile can only be shot down, as I found out after I'd wasted a load of missiles on it.

Interceptor is brilliantly designed. It stretches your playing ability progressively. It is also full of great touches.

You can view the plane from inside the cockpit, looking all the way around to check for enemy johnnies on your tail. You can watch the action from a third person position at one of the eight compass points outside the plane, or you can watch from the control tower. These views work just as well when you are parachuting down after a missile hit. A zoom gives a better feeing of depth.

There are some bugs. I have managed to fly over the carrier and have the wing disappear under the ship. It is common practice to land on the sea, but none of these matters when you take into account the days of fun you'll have when you take to the air with Interceptor.

INTERCEPTOR is protected with a code wheel, something of which I approve. Along with Magnetic Scrolls-type novella protection, this allows the honest user to make disc back-ups, and often allows the transfer to hard disc, but it reduces the problems of piracy.

Sure the crooks will rip apart the code and produce an unprotected version, but at least we don't have to suffer if our discs get corrupted. The Interceptor code wheel feels like part of the game, not a bid to prove your innocence.

I like the way you can run the demo without using the wheel, a taunt to the person who steals a copy. He can see what he is missing without playing.



You will learn to handle the controls

REPORT CARD

F/A 18 Interceptor
Electronic Arts
Price £24.95

SOUND
Wonderful sampled sounds which get louder when you view from outside.

GRAPHICS
Fast 3D solids with a surprising amount of detail including the EA offices in California and Alcatraz.

GAMEPLAY
A good range of missions. Spaced in difficulty gives sense of achievement.

USE OF THE AMIGA
A game only possible on the Amiga. It uses the blitter and sampled sound.

VALUE
Hours of fun packed flying time. You will want to go back for more when you have finished all the missions.

OVERALL *96%*
The greatest Amiga game ever. You will believe a computer can make you fly.

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SINCE its inception the Amiga has played host to many stunning examples, either painted or digitised, of its graphics capabilities. More recent items have been generated by the computer itself from a description of a world, resulting in a static or animated picture.

Until recently, there have been no tools to explore the potential of the Amiga to generate images and animations. The first of the packages was Videoscape 3D, which does not provide any means of easily describing the world, but gives animation.

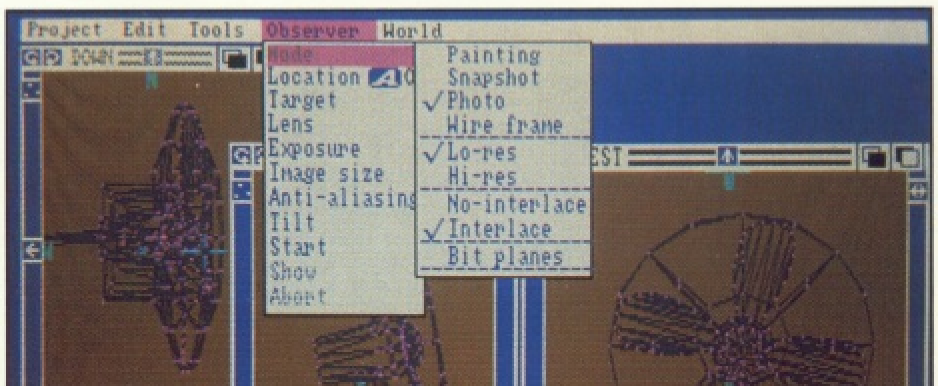
Dr Eric Graham, the creator of the Juggler program, continued his work to produce Sculpt 3D from Byte-by-Byte. This has a user interface to help create objects without graph paper and typing lists of numbers. You generate images with a technique known as ray-tracing. This uses a large amount of computer time to generate realistic pictures including shading, shadows and reflections.

The facility to animate a scene is provided by Animate 3D. Used in conjunction with Sculpt 3D, Animate

Tour through Sculpt and Animate 3D

Since Boing, other micros have tried to emulate the Amiga's demos. Sam Littlewood tests a couple of programs which will help it stay out front

Excellence



describes how objects move and change with time. The resulting sequence of images can then be compressed and played back in real time or recorded frame-by-frame on to a flying erase head video recorder.

In both Videoscape and Animate 3D the individual frames of an animation are generated one by one, taking between seconds and hours apiece. To play the images at the correct rate, they are compressed into a special file format that can be played back in real time. If a special video recorder is available it is possible to record each image directly on to video tape as it is created. This allows much longer animations, as they are not limited by memory needed for playback.

SCULPT 3D comes on a single disc containing the main program and a set of example objects and images. It can be used on a 512k machine, but it is limited, as without a megabyte or more, complicated objects and higher resolution pictures cannot be generated.

Sculpt 3D does not take over the machine, and can be run from the Workbench or CLI and it knows about PAL machines. The user interface is through normal windows, gadgets and menus.

EDITING objects involves three windows, collectively known as the Tri-View, representing a box in the three dimensional space. The three windows are views of the bit of the world within the box from the top, west and north. They are normal Intuition windows that can be depth-arranged and re-sized. Additional gadgets move the box around in space and zoom in and out.

A cursor within the box indicates positions in space. Shown as a blue cross in each of the windows this can be moved by clicking the left mouse button. As the windows are only two-dimensional, it may be necessary to click in two windows to position the cursor exactly where it is required.

A scene manipulated with Sculpt 3D consists of vertices – points in space, edges – lines joining vertices, and faces. Faces are the triangular shapes implied when three vertices are joined by three edges. The Tri-View displays only the vertices and edges.

To create a vertex, the cursor is moved to the correct position inside the Tri-View, and the right mouse button is clicked while the left is held down. The 'edge' gadgets on the windows create edges between selected vertices. Existing sets vertices can be easily manipulated by using various options to drag, rotate, expand, contract or delete them. It is easy to forget that there are unseen selected vertices outside the Tri-View, and accidentally include these in a manipulation.

It would be possible to build an object by simply creating each vertex and joining them together by hand. Often objects or bits of objects are themes on common elements like cubes, spheres, discs and so on. Sculpt 3D has a menu-driven way of incorporating them into the scene being made.

The new object is dumped in the middle of the Tri-View box at a sensible size. It can then be dragged, scaled and rotated to the right place.

ANOTHER method of building up objects is to take an existing set of vertices and do things with them. Sculpt-3D can make a straight copy – a copy connected to the original with edges and faces, a "spun" object like a vase starting from a silhouette of one edge, a reflected copy and others.

With these tricks it is relatively easy to build up a complicated scene by starting with a few simple objects and then cutting, stretching, copying, and rotating until the shapes are formed.

A useful last resort is that Sculpt 3D can be driven by a script from a text file. All the creation and editing actions are available, so common complicated command sequences can be put in a script and a program written that describes an object, for example, lettering. This opens up the possibility of converting other systems data files into Sculpt-3D scripts.

To get a picture of a scene, there must be more than the objects: Things like colour, lamps and an observer. Faces can have colour, texture and smoothing. Colour is controlled by a requester. It allows red-green-blue control, as well as hue-saturation-value, like Deluxe Paint. Texture can be one of dull, shiny, luminous, mirror or glass.

If a face is smoothed it appears to ▶



◄

be curved in line with the faces around it. A dodecahedron with smoothed faces would look more like a sphere.

Several parameters are associated with the observer. There is the position of the eye, the point being looked at and the focal length of the lens, or zoom. The two positions can be set by selecting a point in the Tri-View and then selecting a menu option. The zoom can either be selected from three pre-defined values or given an exact numeric value.

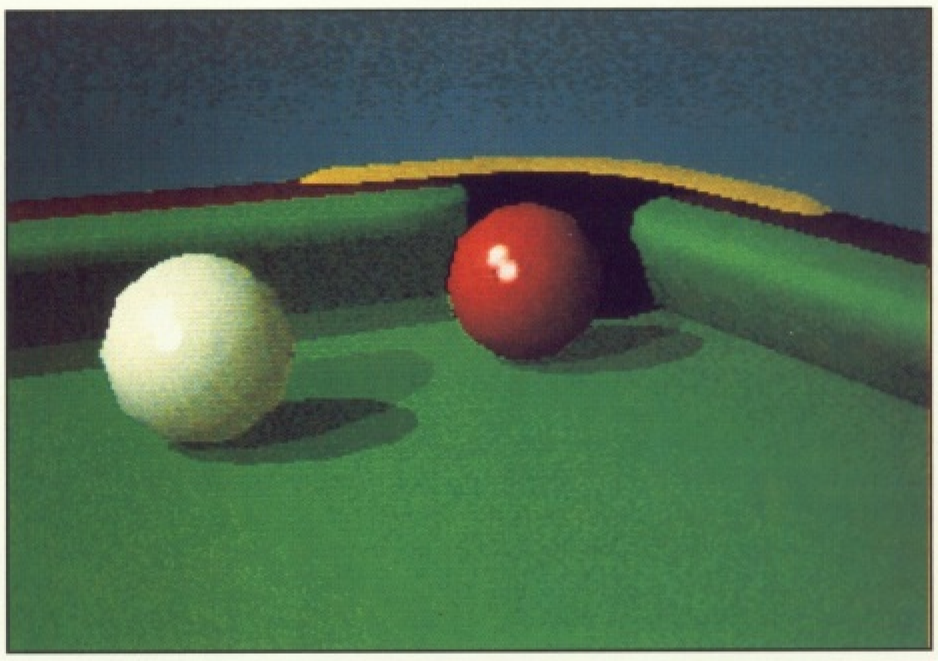
Lamps, with colour and brightness, are created by selecting a position in the Tri-View, and then a menu option. A further option is the ground and sky. The ground can be a solid colour or checked, and the sky can be graduated from one colour at the zenith to another at the horizon.

WITH the scene set up, a picture can be taken. There are various options at this point. The first is the method that will be used to render the image. Choices are Wireframe, Painting, Snapshot or Photo. Wireframe is used for previewing, and just draws an outline representation of the picture. This is done in a second or so – good for checking the positions of objects and whether the observer is set up correctly.

Painting renders each face in a fixed colour. It doesn't do shadows, reflections, smoothing or the more complicated lighting. This technique is also used by VideoScape 3D. It takes maybe 10 seconds to generate the image, and gives a better feel for what the final ray-traced image will be like.

Snapshot is a ray tracing mode, giving correct shading and smoothing without the shadows and reflections. This may take an hour or more to generate for a full size image and finds a use in producing final images where shadows and reflections are not important.

The most realistic mode is Photo, which copes with shadows and reflection, but takes several hours for a full size image. By using the other modes for previewing, Photo mode can be avoided until the final image is produced.



A way to cut rendering time is to make the image smaller – useful for checking out shadows and the lighting. The image size can be full screen – an overscan image that fills the borders, or half, quarter and eighth of full size.

The number of bit-planes and the display mode used for the image can be controlled: Low resolution, high resolution, interlace and HAM are all possible.

A further option is not to render the image to the screen, but to three files, each containing bytes for the red, green and blue value of each pixel. Although this cannot be displayed on the Amiga, it might be possible on a colour printer or another computer. A nice feature is that during image generation Sculpt 3D will attempt to show how much time is needed to finish the picture.

The editing interface takes time to master, but once understood, is powerful and easy. It does allow creation of objects, as opposed to fighting with numbers and bits of folded paper. The choice of rendering techniques is excellent, leading to the time-consuming ones only being used when it will be worthwhile. The manual is well written, including tutorial and reference sections. The result is a useable tool, not a toy.

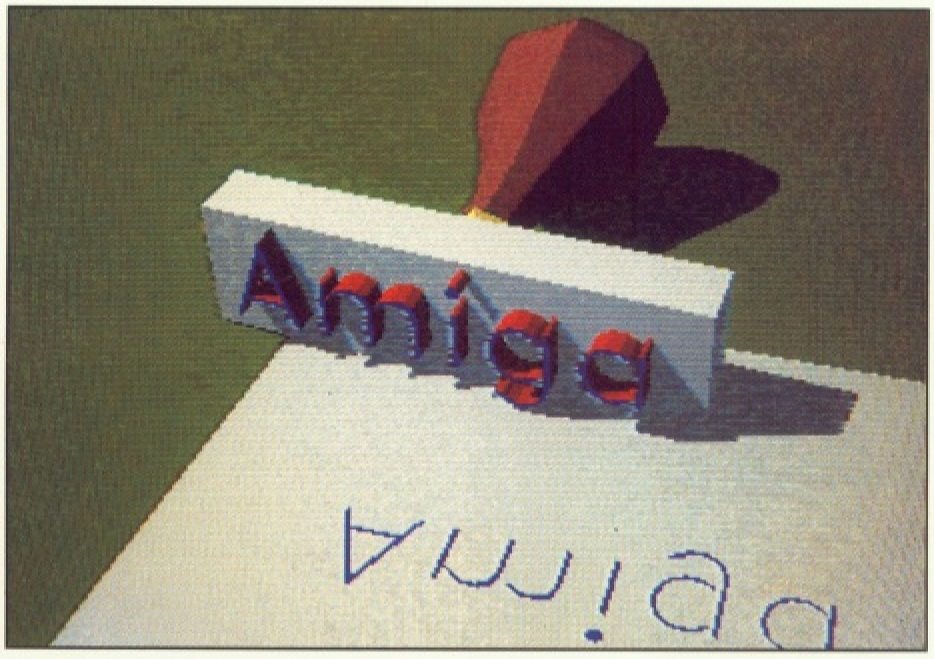
ANIMATE 3D is supplied on two discs – one for the program, and the other containing example animations. It requires Sculpt 3D, pushing the memory requirement up to a minimum of 1Mb, with more needed for complicated work. There have been no problems running it in 2Mb as long as nothing else big is running as well.

The user interface is the same as Sculpt 3D's with additional menu items to handle the animation. Some features have been added to the basic modelling commands, the main one being splines. These extras are extraordinarily useful, and should have been in the original Sculpt 3D.

A line of vertices connected by edges can be made a spline. A few of the vertices become control points, and the rest follow in a curve between them. The "stiffness" of the spline and several other attributes can be modified, giving a powerful tool.

A second new feature is that a scene can be named in a hierachical fashion. So "fan" could have children "base" and "head". "Head" could then have children "motor" and "hub". "Hub" could then have four blades as its children. It is possible to select/erase/load/save a named group of vertices.

Animate 3D can be used for static images in the same way as Sculpt 3D. When a "take" is selected, it becomes an animator. A "take" is not a static scene, but all the information pertinent to a complete animation. It consists of scenes describing how the



world changes over time, along with how many frames the animation consists of, if a ram animation is to be used, if it is a loop animation and so on.

As more than one scene is used in a take, it is important to remember to save the changes in one scene before going on to edit another.

IT is not necessary to edit a complete scene for every frame of the animation. Animate 3D has two ways of describing the changes with time. The first is the global scene. This is a single scene, as in Sculpt 3D, that is present for the whole animation.

A new type of object is a path, a set of vertices connected by edges, possibly a spline, describing motion over time. Parts of the named hierachy can be attached to the path by making them children of a path. Paths can be attached to paths. A plane could be attached to a straight path, while its propeller spins on a circular path relative to the plane. An object can be rolled, pitched and yawed as it travels. Objects, the eye, the point being looked at and lamps can all be attached to paths.

The second method of animating is to edit scenes that describe how the world looks at key points in time, letting Animate 3D interpolate the inbetween frames. Objects can change shape and size in any way.

A limitation when using this technique is that two key frames with frames in between must have the same number of vertices and the vertices must have been created in the same order. This is so that Animate 3D can do the inbetweening. A good way to create key frames is to edit the first one normally, then copy it to the other key places. The vertices in these other frames can now be dragged, scaled, and stretched as necessary.

The inbetweening process not only covers vertices, but colours, lighting, observer positions and zoom. A global scene and inbetweening can be mixed in the same animation as appropriate.

THE controls available for rendering an image are also available for an animation. In addition, there is a fast wire-frame preview of the animation. Single frames can be rendered for checking – they will not be re-rendered when it comes to the complete animation. As ray-tracing is so time consuming, it may be worth using painting mode. Movement can distract from a multitude of rendering sins.

Animate 3D gives access to all three aspects of animation: Modelling, animation and rendering. As with Sculpt 3D, it is a tool that once mastered, does not get in the way of creation.

The manual is harder work than Sculpt 3D, not giving as much in the way of a tutorial. If the area of computer generated images and animation is of interest to you, then both packages will be rewarding.

REPORT CARD

Sculpt 3D
Amiga Centre Scotland. Tel: 031-557 4242.
£69.95

USEFULNESS ....
Sculpt makes it possible for anyone with patience to create picture.

EASE OF USE.........
Eases the complicated problem of creating and editing shapes in 3D.

INTUITION............
Fully multi-tasking and runs from Workbench. Uses masses of memory.

SPEED.....................
It can take 20 hours to ray-trace a scene. A reflection of the processing power not a programming fault.

VALUE ....
Not exactly a bargain but a sensible price for an advanced graphics tool.

OVERALL 82%

A well thought out package with wider appeal than most design programs.

REPORT CARD

Animate 3D
Amiga Centre Scotland. Tel: 031-557 4242
£69.95

USEFULNESS ....
Great for producing rolling demos but needs an A500 to be expanded to 1Mb.

EASE OF USE.........
Splines make shape definition easier than in Sculpt. Friendly interface.

INTUITION............
Written with the developer's guidelines firmly in mind. A kosher program.

SPEED.....................
Helped by not having to re-render frames but still processor hungry.

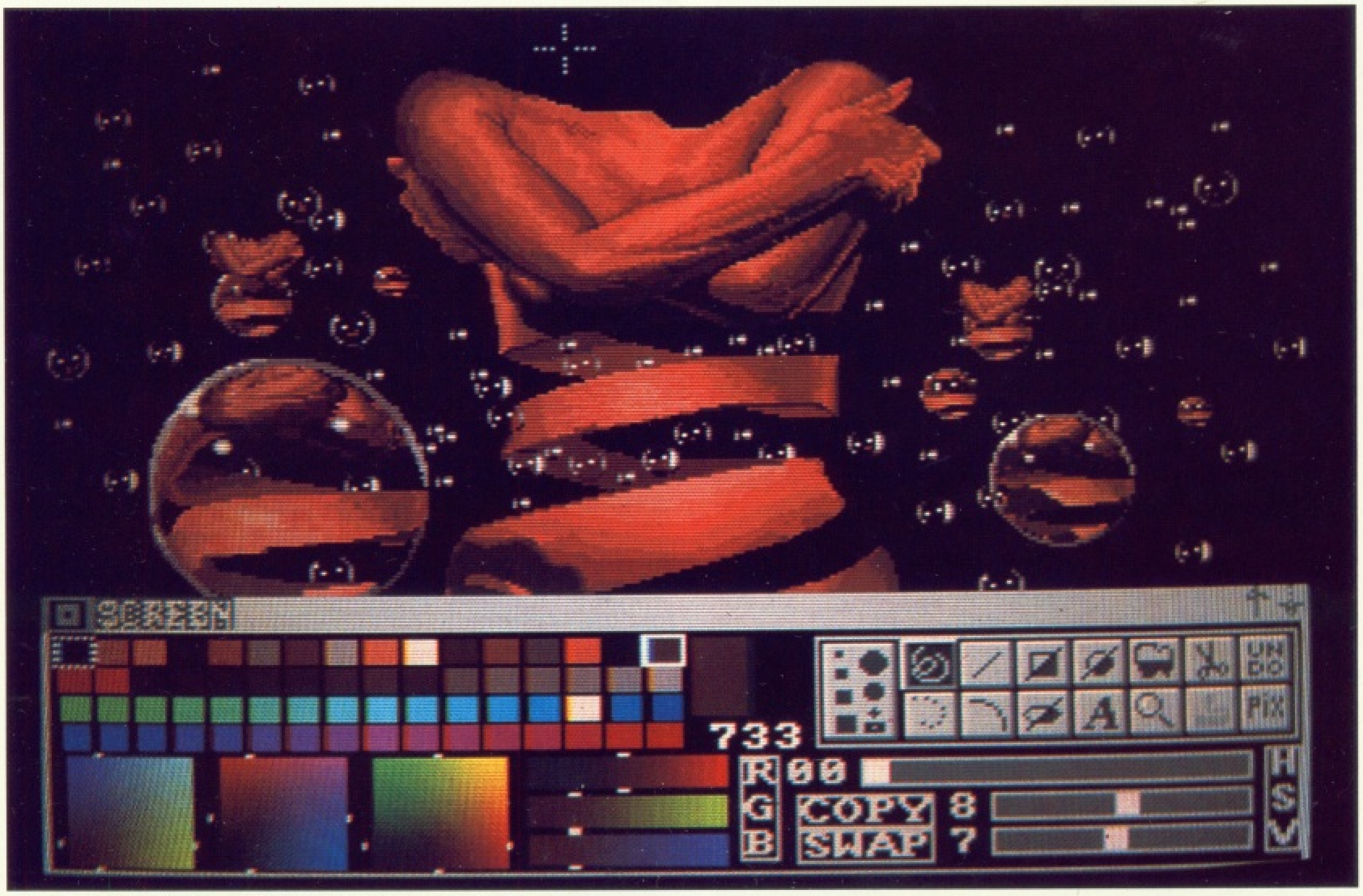
VALUE ....
Needs Sculpt which brings up the overall cost, but can produce unrivalled graphical results.

OVERALL 79%

Ideal for producing stunning demos once you have made the investment in money and time to master it.



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Photon Paint comes with a good selection of screens

Arty facts

Simon Rockman takes a look at the program which could oust Deluxe Paint from the artist's garret

ALL Amiga 500s come with Electronic Arts' universally praised Deluxe Paint. So anyone who wants to sell an art package needs to make sure that it is exceptionally good to persuade a Deluxe Paint-owning Amigaist to spend hard earned shekels on another program. Photon Paint is the thing to do just that.

Deluxe Paint can't cope with the 4,096 colour Hold And Modify (HAM) mode. Photon Paint can. The advertising claims that it will expand your paint capabilities as never before. No package is going to make me a great artist, but what Photon Paint will do is allow me to start with some simple building blocks and produce a creditable result.

One look at the packaging reveals that Photon Paint is truly international. It is sold in the UK by Activision which has the rights to all the products from the Californian-based Microillusions. It in turn has bought the program from Bazboo Soft, a company in Tel Aviv.

The program feels right from the moment you load it. It has clearly been designed by a programmer who uses art packages. The menu can be moved around the screen or toggled off. An extended menu allows you to play with colours.

The menu selection can be a little tedious since many sections are stored on disc, no doubt to leave room for the pictures.

The package supports NTSC and PAL TV standards, with overscan for the video production fraternity. Changing from NTSC to PAL means that you can keep the menu on the screen without obscuring the picture. One strange problem is that the alternate screen has to be wiped to change modes while the displayed screen is safe.

At first I thought that this was a ram limitation, but on a 3Mb machine I was able to save the alternate screen, change modes and then re-load. The ram management is very good, with plenty of warnings if you are about to run out of memory, including the option to disable the Undo command to release extra ram.

THE standard option to cut a box and turn it into a brush has the extra, machine-taxing, facility which allows you to cut around a shape freehand and turn that into a brush. Unlike DPaint, you cannot draw with a brush, only position it and plonk the image on the page.

One of the great features offered by a brush is the blend option. This makes it translucent, so that the background shows through. You can control how much shows over different areas of the brush, an effect which would be almost impossible to achieve by just drawing.

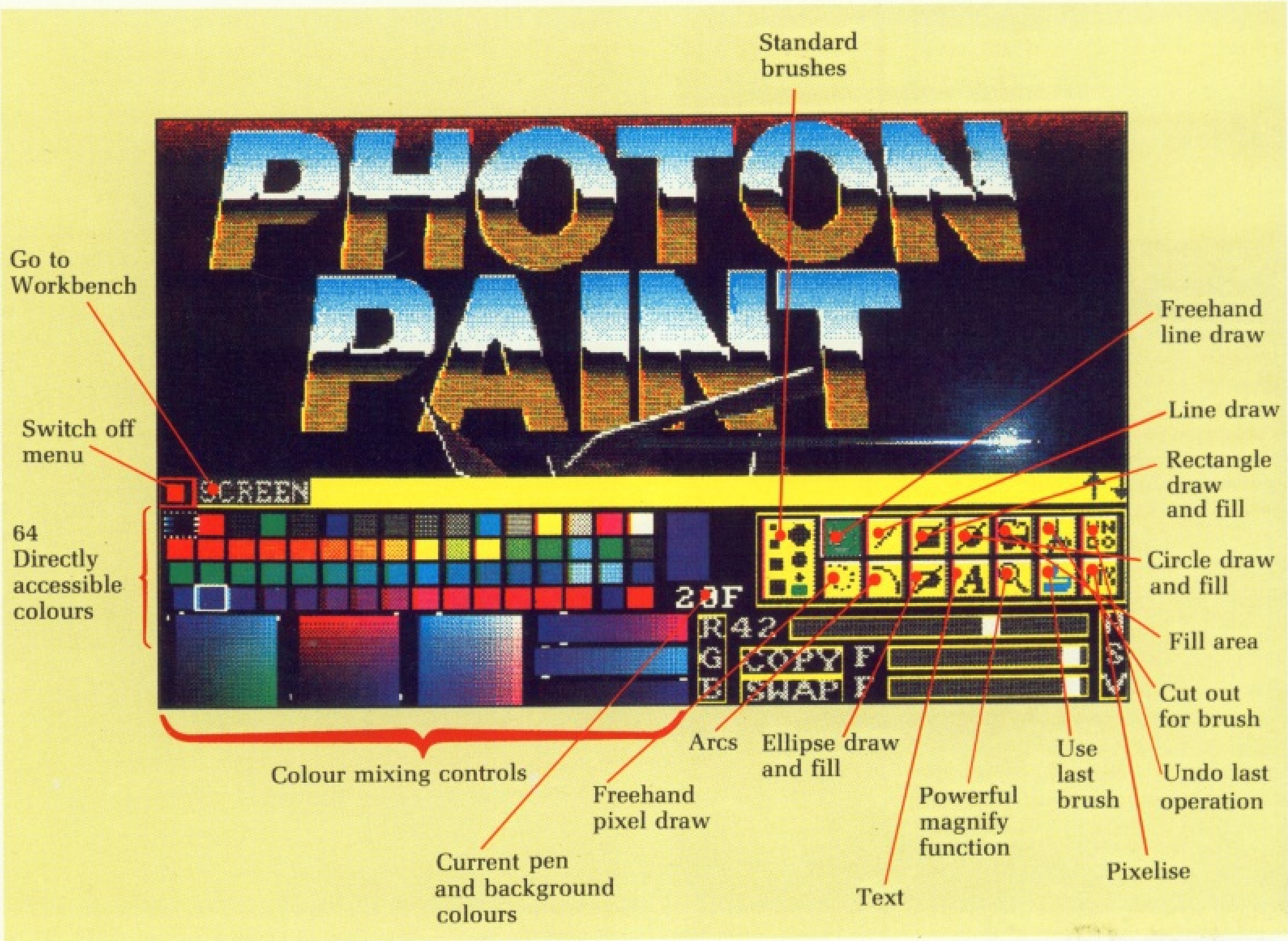
Everyone who is familiar with Deluxe Paint will feel at home with Photon. A good number of the controls are the same, things like J to swap screens, and a similar pen control. There are lines, dots, arcs, hollow and filled rectangles. It often looks as though the authors have looked at Dpaint and thought "How can I improve on that".

The fonts menu has a wide number of options, with italic, bold, underline, outline and reverse. If you have shading on, the letters will be stippled. Great effects can be achieved by cutting the text as a brush, then blending and creating a drop shadow.

There are many special effects controls. Pictures can be pixelised – a feature much enjoyed by pop videos – which enlarges each pixel to produce a chunky image. Just think, we've spent years watching computer graphics improve, getting less chunky ►



". . . a picture is worth a thousand words"



and now we have an option to do the reverse.

The main special effects allow you to play tricks with the brush, notably the ability to wrap a shape around a 3D object. A cone, tube, ball and block are defined as standard, but you are free to draw your own shape and then wrap the brush around it.

Experience has taught me that you need a picture with all the detail at the centre and plenty of colours at the edges to show that it has been wrapped around a shape. Lighting effects can be used to really give the impression of 3D.

Photon Paint's documentation is clear; printed in a crisp, spiral bound book it is very easy to follow. It does err on the "I don't know anything about computers" side, and perhaps fails to get technical enough.

I thought the greatest failing was the lack of pictures. Describing icons is less effective than showing them, and in the case of special effects a picture is worth a thousand words.

Pictures apart, the manual is well written. The tutorial takes you to a stage where you really feel in control of the package, although I kept on running before I could walk and trying things too soon.

We are asked to believe that the manual was written by one Heidi Turnipseed. This nom de plume leaves me wondering if there really is some poor woman in California, born out of the flower power years, who has to live with such a name on her driving licence.

THE outstanding features of Photon Paint are the brush controls, which are great fun. Even if the package did not offer all its other great features, speed and overall slickness, I'd buy it for the brush menu alone.

Combine the features it does have and the program is a winner. As ever, the price is steep. Activision has it at £69.95, which means that you have to be pretty serious about artwork, however good the package is.

I'm not saying that Photon Paint isn't worth £70, just that there are an awful lot of people who can't afford to spend that much on any piece of software and who would get a great deal of pleasure from using it.

REPORT CARD

Photon Paint
MicroIllusions/Bazboo Soft/Activision
01-431-1101
£69.95

USEFULNESS ....
A fully featured drawing program which can cope with the HAM mode.

EASE OF USE.........
A combination of intuitive and Deluxe Paint type icons mean you do not need the easy to follow manual supplied.

INTUITION............
A proper multi-tasting program, but it is necessarily ram hungry. Would not always swap to Workbench.

SPEED....................
Amazingly fast with good prompts to keep you informed when performing processor-intensive operations.

VALUE ....
Not that expensive when you look at how well the program performs but it is priced beyond many users' budgets.

OVERALL 88%
The best paint package the Amiga has seen. A good example of how one programmer learns from another.

The plain man's guide to CLI

This month Phil South delves into the little understood ASSIGN function of AmigaDos

WE covered a fair amount of ground in last month's *Amiga Computing,* talking about AmigaDos and its purpose in life. This time I thought we'd dive right in and cover a few common problem areas. In particular we'll be talking about the ASSIGN command.

ASSIGN is much misunderstood as a command, and people who only know of its existence through altering their s/startup-sequence to read Dos words from RAM: rather than disc are starting from a disadvantage. Like as not you find it lurking in a short listing in a magazine, along with a little discourse about logical devices and not much else. So let's take it one step at a time.

To aid expansion the Amiga is an open architecture machine. This means nothing is ever in the same place in any two programs (a slight generalisation, but bear with me).

On a familiar 8 bit machine, like the C64, every character in the default font lies in its own location in memory, accessible at any time. In Amiga computers the fonts are ASSIGNed to a directory (which could be anywhere on the disc) as the logical device FONTS:. Note the trailing colon, the symbol that denotes a logical device.

Whenever AmigaDos needs the fonts directory, it knows where it resides due to the ASSIGNment, and so goes straight to it. There are other logical devices, too. Here are some of the ones you need to know about:

SYS: *System disc root directory*
C: *AmigaDos commands directory*
L: *Library directory*
S: *Sequence library*
LIBS: *Library for OpenLibrary calls*
DEVS: *Device for OpenLibrary calls*
FONTS: *Loadable fonts for OpenFonts*

THE purpose of all this is that ANY program can refer to and utilise an important function, library or command, regardless of where it actually is. Let's look at each logical device in turn, and see what we need to know about them.

SYS: is the system root directory. When you first boot the system, AmigaDos automatically assigns SYS: to the root directory disc in drive DF0:. So any programs on that disc which need the boot disc know which volume to ask for: "Please replace WB A500 1.2 in drive 0" sort of thing.

C: is a very important logical device, as this is where AmigaDos looks for all the commands in AmigaDos. That sounds a little contradictory, but we are talking two different levels of AmigaDos here. The system level looks for commands for the CLI command level.

The C: directory can be assigned anywhere, but a good place to assign it is to the RAM: disc, after having copied the c directory there of course. This means all your AmigaDos commands will be in memory rather than grinding off of disc every time you type one.

L: is the place where all the "overlays" for big commands and non-resident parts of the operating system are kept, in the library directory. Things like Ram-Handler, Disc-Validator and Port-Handler are hiding in here, and they are blipped out whenever you need them. Hmm, it does seem like there's a lot to load off of disc whenever you want to do anything on the Amiga, doesn't it? The operating system part of AmigaDos needs this directory to operate at all.

The **S:** logical device looks for all the sequences in the Sequence Library. These are used by the EXECUTE AmigaDos command, and the sequence – otherwise referred to as batch files – runs them. Batch files are the rough equivalent of programs in AmigaDos, but are perhaps best looked at as mere lists of useful commands. You can build more powerful c directory commands using batch files.

The remaining functions are just for providing a pointer towards the more complex library functions of the Amiga. To delve into those would take a whole feature to themselves, so let's drop them before I get carried away.

ASSIGN itself is used to direct program flow to the function, command or library it wants in this syntax:

```
ASSIGN <logical device> <directory>
```

So assigning your c directory to the ramdisc would take the form:

```
ASSIGN c: ram:c
```

From then on all your AmigaDos commands will be read out of ram:. The other main use of ASSIGN that presents itself is when you need to tell AmigaDos to read system information from your new hard disc or DH0:. You would simply type a simple sequence of events like:

```
ASSIGN SYS: DH0:
ASSIGN C: DH0:C
ASSIGN L: DH0:L
ASSIGN S:
```

and so on.

SO there you have it. All you really wanted to know about ASSIGN, but didn't know where to look. As always, the best place to look – besides *Amiga Computing*, of course! – is in the AmigaDos Reference Manual (Bantam), where you'll find more than you really want to know about the operating system of your computer.

Incidentally, if you get lost when you're in AmigaDos, just type ASSIGN LIST, or even just ASSIGN, if you're feeling lazy. This will present you with a little road map of the current assignments and mounted volumes, just to put you in the picture. By the way, this trick also works for CD on it's own, which tells you the pathname you're currently CDed to. Happy CLI-ing.

Hot impression or major impact?

Two printers head-to-head. Who'll be first past the ribbon? Rupert Goodwins looks at their performance on paper, and finds out who's hue suits him best

IT'S a touching scene. With trembling hands, the new Amiga owner opens the boxes, plugs in the monitor, turns on the power and loads Dpaint. In seconds, the glistening deathmask of King Tut is illuminating the living room. The silence is broken only by the gentle sound of jaws dropping.

But dissatisfaction soon sets in. "If only," thinks our new owner, "if only I could print it out". But this is not to be. A swift perusal of the prices of colour printers has the same mandible marooning effect as that first encounter with Tut.

The curse of the fair old price.

However, there has been a more affordable alternative around for a while – the Okimate 20. This faintly



odd printer has had the field to itself for a year or so, but at last there's some competition. The Star LC-10 Colour; more conventional in its technology but more than a little exciting pricewise.

Why has it taken so long for the massed ranks of the Japanese printer industry to come up with more than one colour device? Asking a printer to faithfully reproduce 4,096 colours is one thing. Asking it to also print clear, well-formed text in black and white is a different kettle of monochrome herring. And you want it cheap, you demanding so-and-so.

The two printers use different technologies to harden your copy. The Okimate 20 is a hothead; a set of minute heaters sweep past a wax-coated ribbon and melt a pattern on to the paper. The Star prefers to make an impact. A set of pins pushes an inky ribbon into contact with the woodpulp and builds up characters and pictures. However, both produce polychromatic output in a similar manner; by overlaying the primary coloured red, cyan and yellow wax or ink a wide range can be printed.

BET you thought that red, green and blue were the primary colours. There's a lot of confusion over this and now's not the time to go into the physics, but the famous RGB triplet only works for transmitted light, as seen on your monitor. Printed matter relies on dyes absorbing light and mixing red, yellow and cyan on a white background can reproduce any hue.

Next time you pull apart a packet of cornflakes examine the flaps of the box. You'll find blobs in those three colours where the printing process is checked.

Away from the cereal parallel, let's look at the Okimate first. It's one of the smallest printers on offer, colour or no, and it sports a number of interesting design features. Uniquely, it has no form feed or line feed buttons; all paper movements – apart from normal printing – are achieved by twiddling a knurled knob.

There's a five-position switch on the front which sets the overall darkness of the final output and a Select red button which starts or pauses printing. Those and an Open/Close paper lever are all the controls you get. The paper feeds in from the back, and both single sheet and fanfold can be handled.

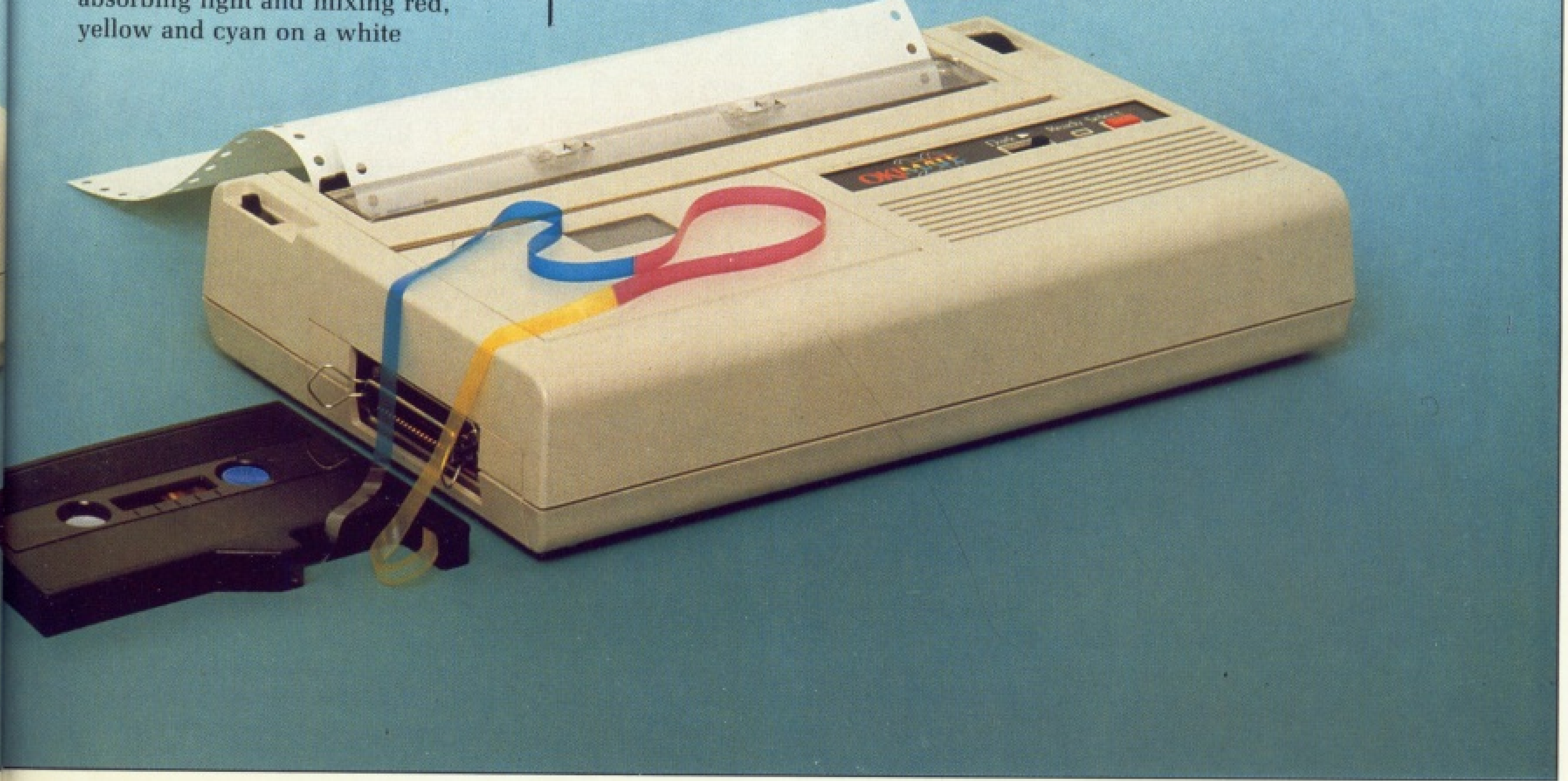
The wax-coated ribbon comes in a large cassette with a marked resemblance to the musical variety. There are two sorts, all-black and the colour version where seven inches of yellow is followed by seven of red and seven of cyan. Due to the nature of the mechanism, where all of the wax on the tape is transferred to the paper at a hot spot, any stretch of ribbon can only be used once.

Printing in colour from Basic is a complicated process. There is a special command code which gets the Okimate to find the beginning of a three-colour sequence on the ribbon. The first line's worth of characters – and you have to print a complete line, even if most of the characters are spaces – appears in yellow, the next line in red and the last in blue. All three appear on the same line on the paper, and thus you can mix colours by printing things at the same position. Only when you've sent three complete lines should you tell the printer to advance the paper, and before you try and print any more you should send the find-beginning code again.

Of course, most people will just use the Okimate-20 driver from the Preferences printer setup. But spare a thought for the poor programmer who wrote it.

THE Star is far more the old style dot matrix printer. Although considerable care has obviously been taken in its design – the lines are smooth and curves take the place of the usual angular edges on the case – the principles of operation draw heavily on Star's experience with ordinary low cost (OK, cheap) printers.

That's not to say that there's any lack of refinement. Buttons on the front allow you to select any one of three near-letter quality typefaces or fast draft (draht as the manual calls it, ▶



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double-draht) without fiddling with control codes, and condensed, italic and proportionally spaced output can be invoked in the same way with just a twinkle of the l'il finger.

Paper feeding is similarly stylish. A hatch at the back of the printer lifts off to reveal the tractor mechanism, and a variety of slots allow for some imaginative configurations. There's a massively clever scheme which feeds single sheets of paper in from the top while unwinding the fanfold just enough to prevent tangling. The idea of this is that you can print a letter without having to unthread your listing paper, although in practice I found it a smidgeon unreliable unless the fanfold was hanging just so. That was the only aspect of the paper handling which even slightly displeased; overall the thing fed with elegance and is the best in that department of any printer I know.

The Star has an altogether more straightforward approach to painting by numbers than the Okimate. The ribbon is ink-soaked fabric, with four horizontal bands – black, red, cyan and (you guessed it) yellow. It sits on a plinth which can, in the manner of Thunderbird 2's launch pad, hinge up and down. This brings one of the four bands in between the print head and the paper, and printing continues in the appropriate colour.

IF you select a colour which is a mix of two of the primaries, then the printer overstrikes automatically. During the time I had it, it worked reliably but there was the occasional bleeding of colour where ink from one colour got carried over (on the head?) after the change for a couple of characters. Also, something streaked the yellow band with a thin line of black after a few pages of screendump, but this was barely noticeable on the page.

A nice extra with the Star is its ability to cope with embedded control codes sent to it in plain text. For example, there's no way with the word processor that I'm using to write this review that I can make a sentence or paragraph a different colour on output with the Okimate. However, by bunging in a little magic along the lines of ((C))0 I can tell the Star to switch colour – and also character size and other effects – without having to worry about esoteric escape codes or special printer drivers.

THIS method does have its limitations though, as the word processor will think of ((C))0 as a word and format the rest of the text around it, although it won't be printed. Also, I can't have the word ((C))0 in my printer output; this might not matter to anyone else but when the time comes to print the printer review...

I had a little fun playing guess-the-printer-driver with the Star; the handbook lists a number of printers which can reasonably be supposed to look like an LC-10, and of course none of them is in the Workbench 1.2 Preferences. However, an adequate performance with screen dumps and

Value

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Samples of the colour output from the Star

text was squeezed out of the Epson JX-80 driver, colour and all.

The handbooks made interesting reading next to each other. The Star's is better written, better organised and altogether more professional in feel; although the Okimate's was adequate and free from the worst excesses of Janglish. From a programmer's point of view, there are more useful sample code snippets in the Star and just more information generally.

BOTH printers have broken away from the Epson habit of putting power switches and cable sockets at the back where the paper gets in the way. And both have the evil DIP switches where the dipsomaniacs can get at them without resorting to tools. The Star has them under the main smoked-plastic cover, on a chunk of bare printed circuit board (naughty), whereas the Okimate has them on the Personality Module.

The Personality Module (great name – do Sirius Cybernetics know?) is a small printed circuit board with the main cable plug on it. By unclipping a plastic shroud, the PM can be removed and the switch settings changed; alternatively the PM can be changed and replaced with one for a serial interface or even for a different computer. Not that you're likely to.

It's intriguing, but the PM is a complete computer. There's a microprocessor – the humble 8051; not much to look at but a member of the biggest selling family of microprocessors in the world. There's probably one in your washing machine, one in your microwave and two in your HumgiWumgi VCR. There's some ram, 16k of rom and a few lumps of chippery to provide input output. Not long ago that would have outgunned many a home computer.

ALL this is fine, but how do they print? The Star is a standard NLQ printer; a year or so ago it would have been classed as very good, but these days we're all used to seeing miraculously good quality from a printer. It's probably as good as you'll get without going to 24-pin – and incidently losing colour. The colour performance is adequate – a useful adjunct but the results are a little dull. With a lot of care in programming, however, I get the feeling that the Star could shine.

The Okimate is a bit of a conundrum. It's capable of excellent pictures – the wax surface is wonderfully glossy – which while no photograph, is up to cheap colour newspaper standard. Its text performance is definitely iffy (can anything be definite and iffy?); the blacks are really black, but the characters are lumpy and not as good as the Star. And the Okimate is horrendously expensive to run. Expect, paper and wax, to pay about a £1 for every full-size full-colour screen dump.

The Star is going to be between 5 and 10 times as cheap to run, and the difference in costs will be even more pronounced when used with black ribbons and ordinary text. The Okimate can use thermal paper as well; although this obviates the need for a ribbon it isn't cheap.

Speed is another place where the Star is a comfortable winner. It's almost twice as fast on dotty text, where it can manage about 120 characters per second, about the same speed on NLQ (but produces nicer characters), and significantly faster on screen dumps. This last is heavily influenced by the software that's driving the printer, of course, and neither the Okimate nor the Star will have finished Tutting by the time you've drunk your coffee.

I COULD have the Star as my only printer, and in fact I suspect it would work well in that role. The wide selection of standard typefaces, together with the simple way to choose them and the extra little touches in the design department make this a printer to watch for. The Okimate has the edge on the glossy pictures, which might make it a good buy if you've already got a good monochrome printer and just want the occasional hard (but not fast) copy that looks rather nice.

But for both the best way to do things is to have a black ribbon for day-to-day work, leaving the colours for Sunday best.

REPORT CARD

Star LC-10
Star Micronics
£285

USEFULNESS ....
A good all round printer which offers colour as a bonus. Strong and looks reliable.

EASE OF USE.........
Sensible positioning of cables and sockets, with good paper feed and front panel controls.

SOFTWARE ....
The Epson JX printer drivers from Workbench produce acceptable results but the Star might benefit from custom drivers.

SPEED....................
Reasonable for a nine pin dot matrix printer. Needs up to eight passes in colour mode but still fairly fast.

VALUE ....
The cheapest colour printer to run and not too expensive to buy. Look out for discounts.

OVERALL *78%*

A natural choice for Amiga owners who want colour but don't think they can afford it.

REPORT CARD

Okimate 20
X-Data 0753 72331
£159

USEFULNESS ....
Really only designed for colour work the Oki is too slow and expensive to use as a print workhorse.

EASE OF USE.........
Good paper feed and clean ribbons make it simple to set up. Programming for colour is complicated by the poor manual.

SOFTWARE ....
With either IBM or Amiga roms installed the preferences driver will work, but the IBM mode leaves gaps between lines.

SPEED....................
The Okimate's Achillies heel is the need to print every line three times.

VALUE ....
While it is exceptionally cheap to buy, the printer suffers badly from high running costs, even when printing text.

OVERALL *65%*

Ideal as a second printer but very limiting if this is to be a prime source of hard copy.

The Californian coders

John Minson heads west to interview the software house which wears an Amiga on its heart

THE small Berkshire town of Langley may seem an unlikely home for a selection of international companies, but Honda's offices lie across one road of the elegant, modern Business Centre, while Epson's logo can be seen from another window. But I'm here to visit American software giant and Amiga specialist, Electronic Arts, whose latest offering, Interceptor, is raved about elsewhere in this issue.

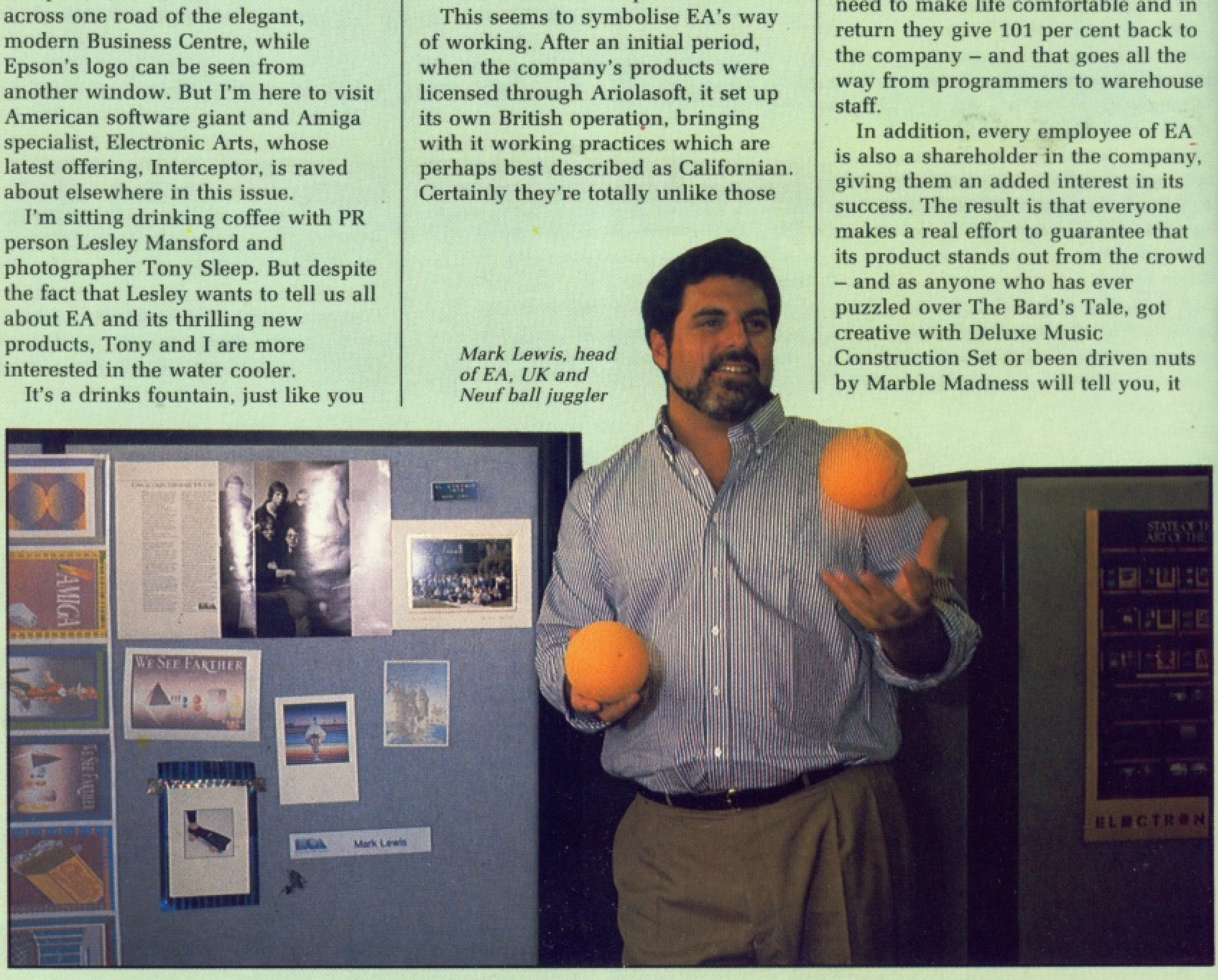
I'm sitting drinking coffee with PR person Lesley Mansford and photographer Tony Sleep. But despite the fact that Lesley wants to tell us all about EA and its thrilling new products, Tony and I are more interested in the water cooler.

It's a drinks fountain, just like you see in all those Hollywood movies, complete with three taps for hot, warm and cold: Red, white and blue like the Stars and Stripes.

This seems to symbolise EA's way of working. After an initial period, when the company's products were licensed through Ariolasoft, it set up its own British operation, bringing with it working practices which are perhaps best described as Californian. Certainly they're totally unlike those of many British companies, where, if you want a drink of corporation pop, you have to rely on staff loo.

Now, before you start sending angry letters to the editor saying that if you'd wanted this sort of thing you'd have bought Water Cooler Monthly, let me explain. Electronic Arts believes in treating its staff decently: It gives them what they need to make life comfortable and in return they give 101 per cent back to the company – and that goes all the way from programmers to warehouse staff.

In addition, every employee of EA is also a shareholder in the company, giving them an added interest in its success. The result is that everyone makes a real effort to guarantee that its product stands out from the crowd – and as anyone who has ever puzzled over The Bard's Tale, got creative with Deluxe Music Construction Set or been driven nuts by Marble Madness will tell you, it



Mark Lewis, head of EA, UK and Neuf ball juggler

works. EA is truly at the leading edge of software.

It's not just Stateside hyperbole that came up with the Arts tag. EA firmly believes that its programmers, musicians and graphics specialists are artists – and it treats them as such.

REALISING that creative minds aren't best served by nine-to-five hours and impossible deadlines, EA assigns each of its projects a producer whose role, just like his namesake in the film industry, is to act as a buffer between the commercial interests of the company and the freedom of the programming team.

It's this sort of liberal attitude that has helped EA attract – and keep – some of the leading talents in software development today.

Only a few months ago Rob Hubbard, doyen of British computer musicians, whose work was to be heard on dozens of products from almost every major publisher, decided to give up his flourishing freelance work for a contract with EA. It's hardly surprising when you consider that contract meant the opportunity to work both in the States and in Britain and, perhaps more importantly, the opportunity to keep on top of all the latest developments in the software world.

"Can a computer make you cry?"

(Electronic Arts' first advertisement.)

Coffee over, Lesley takes Tony and me on a short tour of the offices. There's the bustle of busy people, but though they're on the phone or poring over papers, there's a relaxed atmosphere, almost as if they were... *(gasp)* enjoying themselves. Maybe they are. I know from past experience that it's not unusual to find people still hard at work at seven in the evening – not because they have to but because they want the best for the company.

And when Friday comes round there's none of the POETS day mentality (Push off early – tomorrow's Saturday). Instead, at five, everyone gathers for an informal meeting in which views can be freely aired, they can sink a few cans of Bud, and let off steam throwing featherlight foam balls at each other.

But the biggest surprise is when

"Electronic Arts ... was the 136th firm to enter the home computing field when its first products were shipped in May 1983 ... Today the Electronic Arts brand name is the most respected consumer software brand ..."



The water cooler, imported from the US

Lesley introduces us to the Director of European Publishing (head honcho, UK). Not for Mark Lewis the heavily fortified office with guard dog secretary and gold key to the executive loo. Instead his "cube", as everyone calls the open-plan cubicles, is just like anyone else's. In fact, Mark tells us, its smaller than some, because he needs less desk space.

AROUND the walls are various pieces of EA memorabilia, including the "Can a computer make you cry?" advertisement that first brought the company to the public eye. It set out the philosophy of taking game design further, deeper than ever before, so that it could start to elicit the emotional responses we take for granted in other media such as the cinema. Next to it was a photograph of the founding team taking on this mighty task.

With this in mind, I started by asking this enthusiastic American about the company history. It all started in Silicon Valley with a visionary by the name of William M Hawkins, better known as Trip, who was at that time working for Apple. Mark picks up the story.

"Trip realised that it was software – not hardware – that made people want to buy computers. He had a dream of a company that would bring people a new depth of interactive entertainment, so he brought together a team of people, each with experience in different areas".

This group included Tim Mott, who had previously been with Xerox, to make sure that people got the tools that they needed to do the job (did that include water coolers, I idly wondered) and a guy called Dave Evans for talent seeking.

Together Dave and the team drew up a list of every name they could think of in the Bay area who might be interested in working for the company, then they invited them all to a big, glitzy party to test their reactions. Somehow it seems fitting that EA started with a party.

All this was taking place in early autumn, 1982. Eight months later, in May 1983, the first product was ready to be shipped. Now one of the places which chose to stock it was a shop in Pennsylvania where Mark was working. "These were the best games I'd ever played. I wanted to work for the company"

THE first Electronic Arts games to reach the UK came via Ariolasoft. "It was a good experience for a couple of years but we weren't in touch with the consumers", Mark recalls. "Also, when you're dealing on a license, it's difficult to attract artistic talent. That's one reason we decided to sell direct".

Bringing the Californian philosophy to Britain appears to have paid dividends. EA in the UK now has three production staff, headed by associate producer Joss Ellis, backed by Kevin Shrapnel and Rupert Easterbrook. As well as overseeing conversions for British formats, they are also involved with the development of home-produced product.

The first British EA program is ▶

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likely to be Hyperdrive from newcomer Michael Powell. Though Mark Lewis says that only one in 300 speculative submissions makes the grade, this one did impress them enough to take it further. Nobody wants to say too much about it, as completion is still a couple of months away, but apparently it concerns futuristic, sophisticate bobsled type machines. All should be revealed in the early autumn though.

EA will back teams that it believes in, even if the programs submitted aren't suitable but show talent. And if somebody comes to the company with a great design but doesn't know their assembler from their hex, they'll arrange for him or her to work for a week with a programming team, to see if they hit it off together. It all gets the best from people.

"The truth is that Commodore hasn't built or sold as many Amigas as we had all originally hoped."

(Trip Hawkins, EA President)

Obviously one of the burning questions for readers of this magazine is Electronic Arts' attitude to the Amiga. In the past it's supported it to the full, with games like Ferrari Formula One and the superb Deluxe series of creative applications, some of which, like Deluxe Video, are now being used professionally by advertising agencies and production companies.

But there's no denying that Amiga sales have been slower than everybody hoped, and that for various reasons the machine has not yet had the success that it deserves. Can EA afford to continue to back it, I wondered. Mark Lewis had no hesitation in assuring me that it can and will.

"The Amiga is a beautiful machine – both an auditory and visual experience. And you can do so much with it. There's Deluxe Paint at one end and arcade games at the other". He went on to explain that EA's romance with micro goes back a long way. "We worked closely with the development team. They were based within 20 miles of us and we caught their enthusiasm.

"The popularity of the PC is killing the market for the Amiga in the US", he continues "but it's doing much better over here. When Atari raised the price for the ST, that was a great help. When the two are at the same price the choice should be obvious to potential purchasers. There are two ways to make it take off – for Commodore to push hard and for Electronic Arts to develop leading edge software".

AS if to demonstrate the faith that EA has in the machine, Mark hands me a copy of Deluxe News, a glossy magazine which is automatically sent to all registered users of the Deluxe series, on both sides of the Atlantic. The cover story is about Deluxe PhotoLab, a package which lets you take an existing image or digitise one, manipulate it, then print it at any size up to a ten foot square poster.

But the thing which could really set the Amiga soaring is Mark's confidence that it will lead into optical disc media. He dislikes the overused acronym CDI (Compact Disc – Interactive), but loves its potential. EA already has a demo of an interactive adventure up and running.

"Your screen is like a cinema, and what you see is just what you'd see if you were walking round. Our demo has you walking round EA's headquarters, solving a simple mystery. It's hardly animated but it could quite easily be. In terms of interactive entertainment we're just beginning to realise the possibilities".



Lesley Mansford – proud of Interceptor

He also lets slip that Rob Hubbard is working on the sound-storage tools – which has to be one reason he deserted these shores. "With the Amiga you currently have graphics to match the Saturday morning cartoons – but with compact discs you'll have the movies," Mark enthuses.

Britain will play its part in that revolution. Though Mark professes himself extremely happy that the 8 bit machines are going into a decline, he believes that there have been many advantages in their dominance of the UK market for so long. "You've had the development of really great technical expertise," he said. Your programmers have made the C64 do things the rest of the world couldn't believe".

Already Solar Systems, an associate of Argonaut, has been commissioned to produce an Amiga game. And Mark is in fairly regular contact with ace designer Mike Singleton: "He's waiting for a day when there'll be a machine great enough to catch up with his ideas. The UK will surpass America in terms of making the most of the technical side. It's one of our responsibilities as publishers to develop it properly".

It seemed a good, optimistic note to end on, and to leave Mark to get back to work. As we go he consults his desktop computer to check for messages. Another of EA's revolutionary practices is to link everyone by electronic mail, so that communications for individuals or to everybody on the staff, from Langley or San Mateo, can reach their destination immediately. It also provides an open forum to for the germs of new ideas.

ON the way back to the West End Tony and I are both boggled by what we have seen. Can the method of working really be so perfect? Nothing has suggested otherwise – and the end product suggests that it works too. If I had to bet on a company to create a computer game which will make you laugh, think – yes, even cry – then I'd become a patron of Electronic Arts.

Sample battle

Jez San casts a critical ear over a collection of boxes all designed to get super sounds into your Amiga

IN my quest as a games programmer I've traversed the audio wastelands in search of the ultimate sound sampler. Video games need sampled title music and digitised sound effects. Back in the early days – 1985 – none were available. I rented an Ensoniq Mirage synthesiser so that I could sample some speech, the famous "Missile launched" voice of Clare Edgeley at Rainbird – and transferred it via the Midi port into the ST and Amiga for playback.

Alas the Mirage proved to be unsuitable. Its playback filtering let it get away with lousy sound quality and background hiss – unacceptable when transferred to the Amiga. A Prophet 2000 was hot on features and much better sound quality, but it didn't have any easy ways of getting the samples into the Amiga, so all these rental synthesisers turned out to be less than prophetable.

An Amiga sound sampler, the Mimetics SoundScape, came along just in time. This little black box connected upright into the second ▶



◀ mouse port on an A1000, and produced some very effective results. It was way ahead of its time. Since then, I've had more than my fair share of samplers – Mimetics, Futuresound, PerfectSound. The lot. I've bought, borrowed or stolen (*No, we want the review one back – Ed*) every single one I could get my hands on.

My criteria were simple: Sound quality must be superb, money no object. All very well for a games programmer to scoff at price but it turned out there was no simple solution. None of the units excelled in a way that made them superior. They all had their features and drawbacks. The more expensive ones didn't appear to be any better.

Some of the samplers under test are little more than toys, others semi-professional tools. Nothing currently available for the Amiga is comparable to true studio quality. It is unlikely you could make a record with any of these samplers, but you can have a lot of fun trying.

They are very similar in design, made up of three stages. The input stage which sometimes has an amplifier, the filtering, and lastly the digitising section. Samplers skimp on some or all of these options, to the detriment of versatility or sound quality.

Mimetics' Soundscape

THIS has stereo inputs, but unfortunately the software doesn't take advantage of them, and will only sample in mono. Mimetics supplies sampling packages with its unit for making musical instruments for packages like Deluxe Music, by sampling and creating IFF files.

Samples are limited to 32k in length – about three seconds at the typical 10KHz sample rate – fine for digitising instruments, but useless for long pieces of music or speech. The program also has the ability to interpolate sounds – to move them around and alter their frequency without having to re-sample.

The software runs from the Workbench in little windows, and pops up more windows as you select different options. Fully icon-driven, it tries to be friendly. No doubt reading the manual would help.

A second program supplied is a demo for sampling long contiguous pieces of speech or music. Its samples can only be replayed with their proprietary software being specially encoded. This is because Mimetics does clever tricks to enhance the quality of the sound by recording it with DBX filters and compounding the master volume control over the top of the sound sample. It gives the samples an accuracy of 14 bits when the Amiga can usually only do 8 bits – the other 6 bits are the volume control.



Pro-Sound has a friendly front end

The Mimetics samples really are impressive in quality, and suffer little, if any background hiss. I got the impression that the hardware potential inside the Mimetics box was being incredibly underused. The sampler has a software controlled gain facility that the accompanying software barely utilises. A shame really.

I was generally impressed with the Mimetics box, but frustrated at the lack of portability with the demo program's data files to any other program, including my own. But as a sampler for creating musical instruments there is nothing to fault it. Obviously this sampler was intended for musicians, not programmers.

Applied Visions' FutureSound

FUTURESOUND is a cream coloured box that attaches, via a ribbon cable, to the parallel port at the rear of the Amiga, like almost every other box. It is a mono-only digitiser, has a gain (volume) control and two inputs, one for a microphone and one for a phono line input.

The microphone supplied with the package is junk. Throw it away. Luckily only the mike was useless, the sampler itself being quite good. Why they don't drop the price a bit, and discard the mike from the package is beyond me. This is the only sound sampler that has a switch and passthrough connector to let you use your printer while the sampler is plugged in.

The software supplied with FutureSound is reasonably graphical and powerful. It presents your sound sample information in a friendly manner on the screen, showing the applicable waveforms and allows you to zoom in on any interesting sections. You could also specify start and stop points by clicking on the waveforms with the mouse.

Full control of the sampling and playback rates is supported, as are various edit effects like reversing, mixing and copying waveforms. Most important feature is the ability to do long samples that span the entire free chip memory. This gives a maximum sample length of about 37 seconds at the usual 10 KHz sample rate.

The sound quality is excellent, as is its ability to show you a VU-meter peaklevel to let you know the correct volume at which to sample. Too loud, and you get clicks and pops – known as Clipping – too quiet, and the background noise becomes

unacceptable compared to the sound signal level. I ended up using FutureSound to sample StarGlider's title music – the digitised version – and most of the speech too.

Futuresound is a great package, with good sound quality and nice software. Unfortunately, it is expensive – possibly because it features a quality digitising circuit incorporating an amplifier and filter circuits that really show their effect in the quality department. The software is friendly and easy to use but I was frustrated by its lack of capacity to hold huge (larger than 380k) samples. Various companies have promised ability to use fast memory in the future – something that Futuresound sorely needs.

SunRize Industries' PerfectSound

I FIRST saw the PerfectSound software on PeopleLink, the American computer system renowned for its Amiga software support. I downloaded this free program and was impressed by its capability and friendliness. It rates on par with FutureSound for features, with the added bonus that it supports stereo. It allows you to name each sample you have loaded and click on them to select them – a more powerful approach than FutureSound.

More importantly, it brought news of a really cheap stereo sound digitiser available from the author's company. I phoned him up, and within days I had a prototype board. It looked like two pieces of cardboard held together by chewing gum and a bit of circuitry.

It connects to the parallel port, but this time without any ribbon cable, so it stands precariously out of the back of the Amiga. It has two phono inputs and two gain controls.

I later received a final production of PerfectSound in a smarter metal case, with the two volume knobs poking through holes in the top. This makes it difficult to plug into an A2000 because they stick out. It suffers the same problem of not having any ribbon cable to connect it conveniently to the back of the Amiga. Hopefully they will make it more accessible in the future.

I wasn't particularly impressed with the sound quality, but it scored very highly in the ease-of-use department. It managed to sample everything I asked of it but there was some background hiss. This is because they use an inferior analogue to digital chip, the flash converter variety, rather than the more expensive sample-and-hold type.

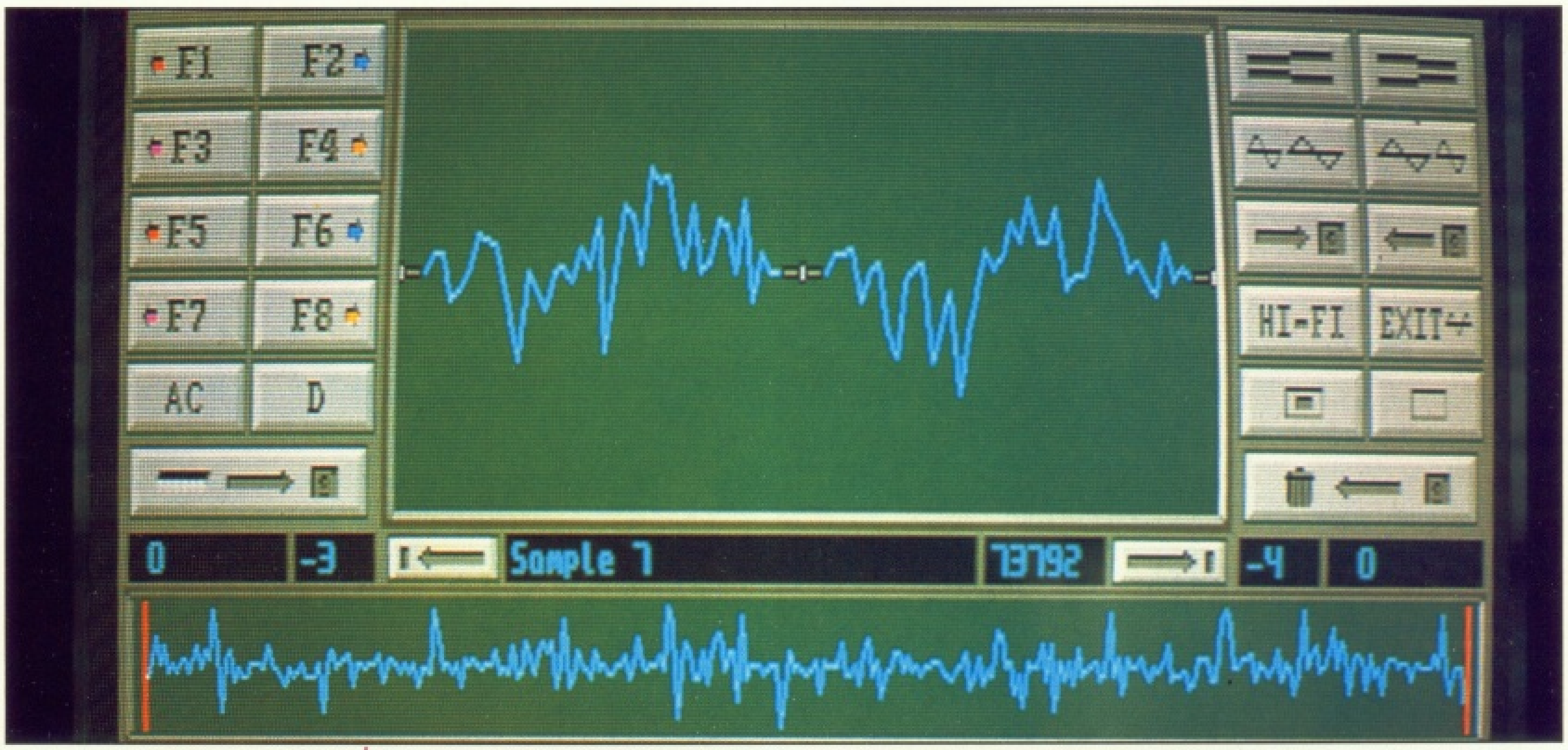
PerfectSound represents the cheapest reasonable entry into sound sampling, but the sound quality leaves a lot to be desired. For a little extra cash there are other, far superior alternatives.

The S5, by Sophus Software and ASAP

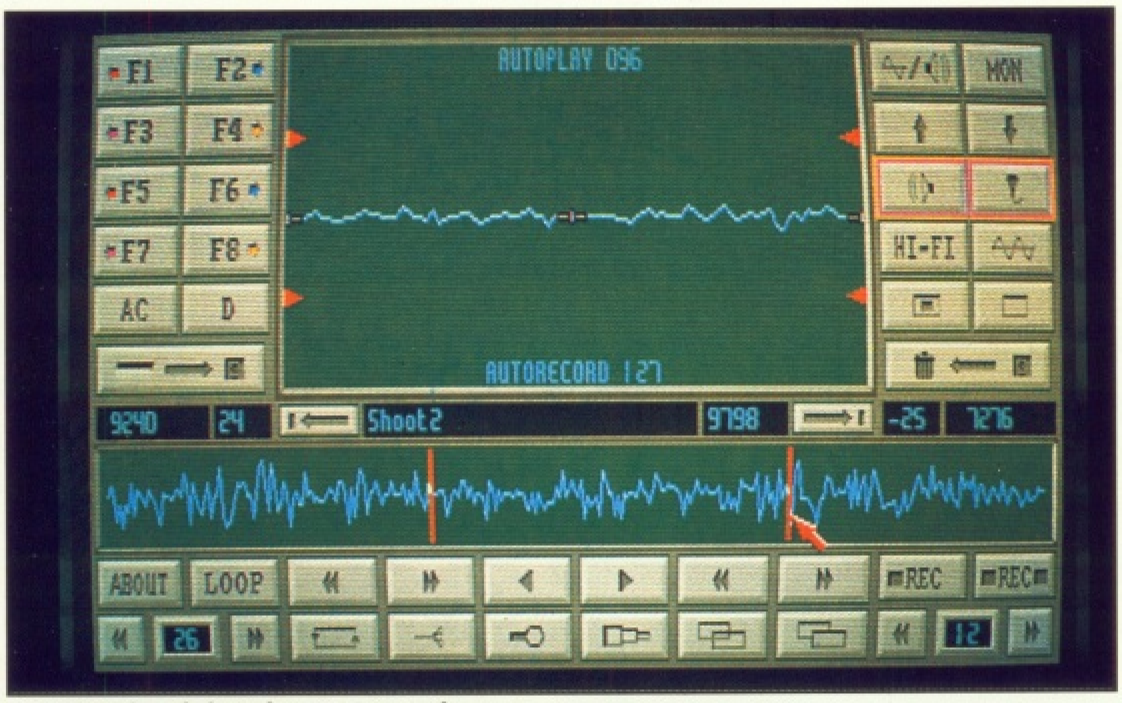
I WAS eager to see the S5, since it is the most expensive sound sampler available for the Amiga. Glancing through the manual I soon noticed it had some really sophisticated features – fast Fourier transformations (FFTs) allow you to plot frequency graphs and there are some really useful fast ram modes. The hardware is impressive stuff: A full stereo sampler which connects to the parallel port via a ribbon cable. It has a gain control and a switchable input with different impedances for microphones or line inputs. Unfortunately it is the software that lets it down – it lacks some basic user interface routines.

You can ask it to do something, like play back your long sample, and it would go to sleep for minutes without even printing a message saying it was busy. A simple "Please Wait" would have gone down a treat, especially for some of the more time consuming functions like rescaling the sample, or FFTs.

On the plus side, the S5 is the only sampler I tested capable of really long samples. It utilises Fast memory when you request it. This means if you have 3.5Mb you can sample an entire track from your favourite CD. For that I'm grateful to the guys at Sophus. They ►



Cute meter levels – perhaps it's a video game



Pro-Sound is definitely a user's package

◄

provide a useful and powerful library of functions to allow programmers to replay digitised sounds from the S5 Sampler. The software defaults to sampling Deluxe Music instruments.

In terms of sound quality the S5 was probably the best. It came on par with FutureSound, but has stereo inputs. If you can grasp how to use it, the software is much more sophisticated. Definitely designed for the professional programmer.

Pro-Sound Designer from Eidersoft

THE Pro-Sound package is unusual in that its software supports both the FutureSound and PerfectSound hardware, as well as Eidersoft's own. Pro-Sound is a stereo sampler in a small self-contained cartridge with no external controls. Having no cable, it connects to the parallel port, clinging upright to the back of the Amiga. Since it's been designed for the A1000 a gender changer is supplied to allow you to connect it to an A2000 or A500. The box has its volume preset internally to what Eidersoft thinks are line levels. This means you must fiddle a little with the volume on your source.

Pro-Sound is definitely a user's package. The software has a cute, friendly icon-based feel to it. Although some of the icons were unusual in function. What struck me was the attention to graphical detail. It's supposed to be a sound sampler and not a video game. But I had a lot of fun, so maybe it was a game after all.

It's an amazing package with really flexible controls, and so easy to use. The waveform viewing and analysis tools were the most powerful I've seen – the cute meter levels look like an oscilloscope with true real-time waveforms being displayed as you adjust the volume control. The ability to hold numerous samples in memory while you edit them is a feature only Perfect Sound is able to duplicate. The flexibility with which you could instantly call things up with function keys is a joy. Eidersoft tells me that a future version of Pro-Sound will cope with Fast memory, but until then.. the maximum sample length is about 30 seconds at 10 khz.

Sound quality is reasonable, although not up to the S5's standards. However I certainly sound it better than PerfectSound. The loss of an external volume control was a bit frustrating for me, since I hate having to play with my Discman's volume to stop the clipping problems caused by high levels. Minor grumbles apart, I'd class the Pro Sound Designer as an above-average product, for a very reasonable price. Excellent.

Summary

DIFFERENCES between the samplers are really quite subtle. Most support the same basic features, and only offer minor improvements. However, I would class the PerfectSound as little more than a toy. The sound quality just isn't up to scratch, but then it is the cheapest unit and so possibly a good entry level box. Buy this only if you can't afford anything better.

In terms of home use, I would definitely recommend the Pro Sound Designer. Being relatively cheap and so easy to use, it has got to be the most fun, and offers quite reasonable results.

The best sampler was undoubtedly the Sophus S5, but it's a shame the top-class hardware was let down by poor software. It was technically the most sophisticated both in terms of sound quality and features, but it was a pig to use. For professionals this represents the best you can buy at the moment. Hopefully Sophus will take another look at its software. A few minor changes will turn it into a grumble-free package.

FutureSound and Mimetics come somewhere in between. Both are badly priced in England, due to importers slapping on huge penalties for buying American. There is nothing wrong with the samplers – they are quite good but they just don't offer value for money.

Where to buy

PerfectSound – £75
Amiga Centre, Scotland
Tel: 031-557 4242

Future Sound – £175
HB Marketing
Tel: 01-844 1202

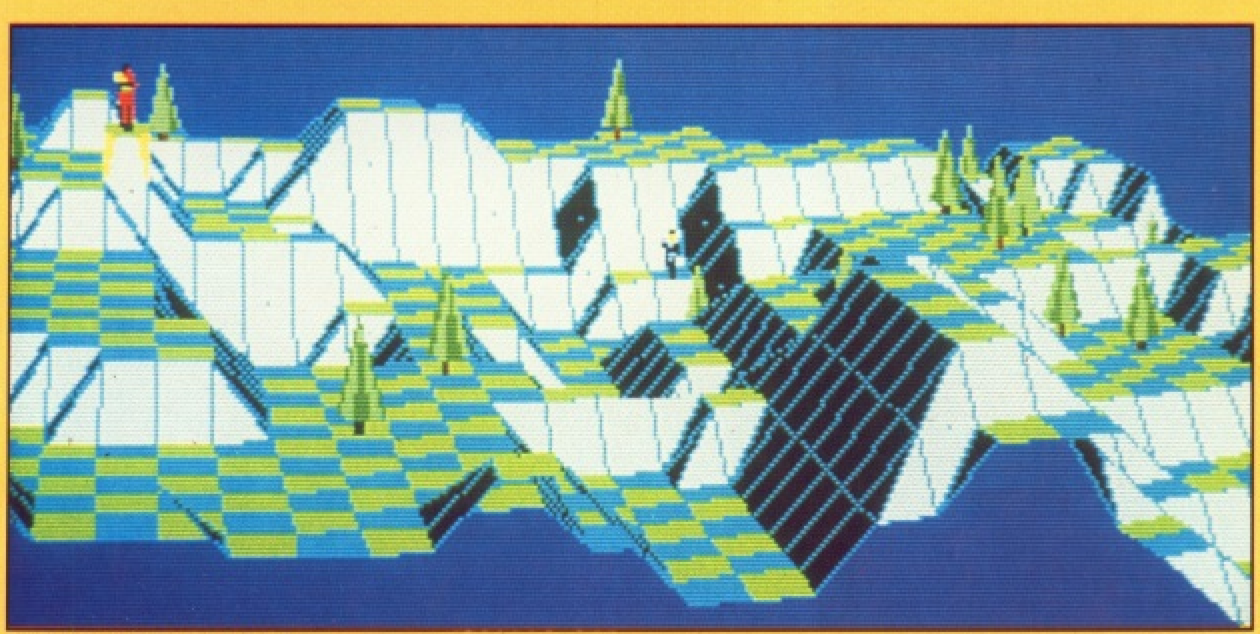
Pro-Sound Designer – £79
Eidersoft
Tel: 0268 541212

Sophus S5 – £199
Applied Systems & Peripherals
Tel: 0724 280222

Thanks to Monkey Business, 66 Victoria Road, Romford, Essex for the loan of the Korg keyboard.

Amiga Arcade

SENTINEL


Viewing one of the 10,000 levels

TOWARDS the end of 1986 that rarest of rarities, an original game, was released by Firebird. Called Sentinel, it was the latest masterpiece by Geoff Crammond, who earlier had proved that the BBC Micro could support top class software with such efforts as Aviator and later the excellent Revs, still regarded by many as the definitive driving game.

Sentinel consists of 10,000 landscapes, each containing a Sentinel and up to six Guardians whose life energy you must absorb before gaining access to another landscape.

Each landscape is rather like a contoured open plan chess board with valleys, mountains and plateaux on which trees abound. The key to the whole game is energy. The smallest unit of energy is a tree; boulders are worth two trees and Sentinels three.

Sentinels are like giant Oscars that slowly rotate on their elevated platforms. Whenever a Sentinel, or Guardian, turns to face you, it begins absorbing your energy, randomly redistributing it throughout the landscape in the form of trees.

The only way you can absorb the energy of the Sentinel, or its Guardians, is by reaching an elevated position in the landscape from which you can look down on its platform.

You can only absorb an object's energy when you can see the square on which it stands. You start each level in the lowest point of the landscape, often only able to see the tops of a few trees and the Sentinel towering above you.

Getting high enough to be able to absorb the Sentinel is in principle simple, but far from easy in practice. Imagine you're standing on the ground with an empty square beside you. You can create a boulder on the empty square. Then, on top of the boulder, you can create a "copy" of yourself into which you can transport.

You're now standing on the boulder looking down on the 'old' you which you can absorb so as not to have lost any net energy, except that tied up in the boulder.

From your new vantage point you can see bits of the landscape visible because of your extra elevation. You may already be able to see the bases of a few of the trees the tops of which you saw earlier. If so, absorb their energy, you're bound to need it later to create more boulders.

And you're not limited to just building one boulder at a time either. Apart from the fact that each one costs two units of energy to create, there is nothing stopping you building a tower of boulders before placing yourself on top. But although it allows you to make big jumps in height, having so much energy tied up in boulders ofter proves to be too risky a strategy.

As soon as a Sentinel or Guardian starts sapping your energy you have to transport to a safe part of the landscape or risk premature death. This means leaving behind all the boulders. Although from your, hopefully, now safe point on the landscape you can begin reabsorbing the boulders, you are now competing with the Sentinel which, even though you've moved, will still absorb any other energy source it sees.

Frequently, a policy of little and often is the key to success. Move from place to place, always staying one step ahead of the Sentinel, without ever having too much capital invested in boulders.

Compared with earlier 8 bit versions and the ST conversion released late last year, Amiga Sentinel, programmed by Steve "Goldrunner" Bak, is faster and has been given a complete sonic overhaul in the form of an incredibly atmospheric set of eerie, almost surrealistic, sound effects and musical cameos courtesy of David Whittaker.

Although the lack of effort put into Amiga conversions is often disappointing, Firebird has wisely decided to stick closely to Crammond's original 8 bit graphics, although they are brighter and crisper than in previous versions.

Any attempt at major modification would have been a big mistake, purely because the original was so perfectly crafted.

If you've never experienced Sentinel, treat yourself to the nearest thing yet to the perfect game. Unless you're an out and out death merchant you won't be disappointed.

David Bishop


Absorb the trees for energy

Sentinel
£19.99
Firebird

- Sound
- Graphics
- Gameplay
- Value

Overall – 90%

FOOTMAN

WE all know the old joke about the first program that is ever released for a new computer: Reversi. If that's true – and it is if you think about it – then the main contender for the second has got to be Pacman, or in this case Footman.

It's been a long time coming, and the thing is, was it worth the wait? Well, sort of.

What you get from TopDown in this case is a bog standard ripola Pacman clone with very few frills. You use joystick or cursor keys and troll off round a whole bunch of mazes – you get 50 on the disc – while being pursued by some arthritic ghosties.

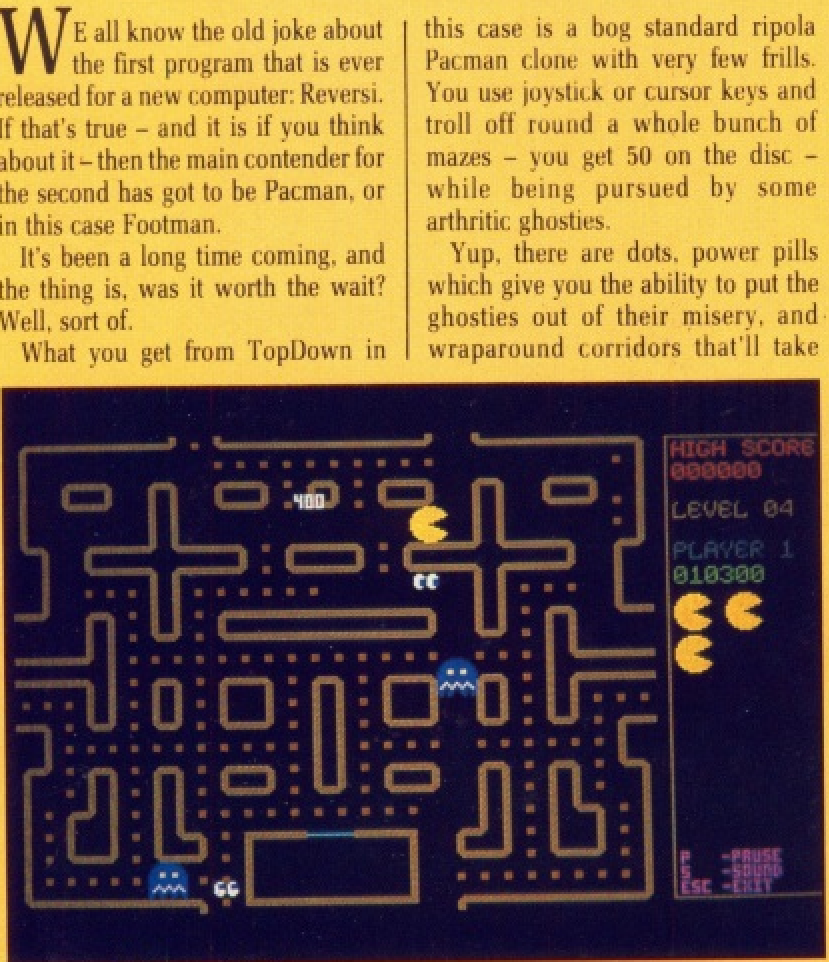
Yup, there are dots, power pills which give you the ability to put the ghosties out of their misery, and wraparound corridors that'll take you from one end of the screen to the other.

Gameplay, when you get down to it, is not particularly fast or startlingly responsive.

So far, so standard, but the redeeming feature of Footman is the comprehensive Maze Editor. This lets you design your own mazes in which to weeble, providing all sorts of opportunities to shock maiden aunts and generally be terribly rude.

That apart, Footman at this price is simply, well, adequate – but only just.

John Baker

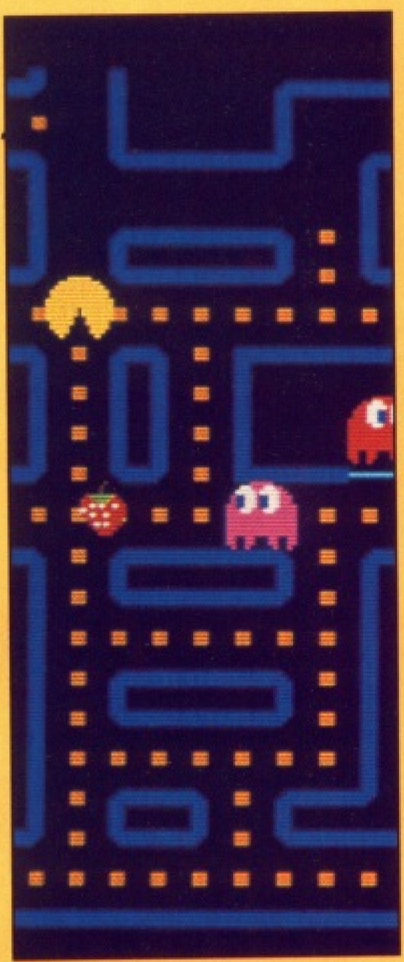


Don't join the dots – gobble them

Footman
£14.99
TopDown Developments

Sound
Graphics
Gameplay
Value

Overall – 28%


It's ghosthunting

BARBARIAN

PICTURE yourself as a barbarian fighting for the love of Maria Whittaker (down boys). You are not alone in your desires and have rival Sun readers to fight off. They come at you one by one in the forest for a "discussion", each with enormous broadswords and very little on.

Prepare yourself before battle commences. You spend the first half hour getting killed, very, very quickly. After a while things get better and you begin to enjoy hacking the foe to bits, especially when a well aimed blow decapitates him.

The head falls to the ground with a spurt of blood from his severed neck accompanied by a scream and satisfying thud as the torso tumbles. Wholesome stuff.

The graphics on Barbarian are a bit of a let down. It would seem that the Atari ST graphics were simply dumped from one machine to the other. The figures are very basic, in colouring and in form. One redeeming factor is that they move in a very lifelike manner especially in the sword fighting.

The game's designer, Steve Brown, videotapes himself wielding swords and kicking, and then watches the tape to produce the graphics.

The digitised sound is very good, the gurgles, screams and thuds being particularly realistic. All good blood curdling stuff, forget your karate games and get into this.

If there's a digitised piccy of Maria at the end, I haven't got there yet, but it gives you an incentive to fight ever onward.

All in all it's a good game and somewhat addictive. A bit more detail in the characters wouldn't have gone amiss.

This must be the last in this series of two guys beating each other up in very nice scenery. It's wearing a bit thin, but no doubt someone will come up with yet another scenario with different graphics and surprisingly familiar gameplay.

A good one for all the hackers out there, that's the violent ones, not the quiet key tapping types, or are you an Arnold Schwarzenegger in Woody Allen clothing?

Brian Chappell



A squelch as the head rolls

Barbarian
£19.95
Palace

Sound
Graphics
Gameplay
Value

Overall – 77%

FERRARI FORMULA 1

AS the Formula 1 season gets into full swing, Electronic Arts has released its latest attack on the Amiga games player in the shape of Ferrari Formula 1.

Designed to bring the thrills and spills of a Formula One racing team to your screen, the game revolves closely around the 1986 Ferrari team of Michele Alboreto and Stefan Johansson – even though Johansson has since been booted out in favour of the faster Gerhard Berger, who in this game is racing for Benetton!

Apart from Acornsoft's Revs, most software houses have been too terrified to release a game which actually involved the technicalities of driving a racing car. Games such as Pole Position and Super Sprint are simply arcade games with a car as the theme, as opposed to a fish or a banana.

Ferrari Formula 1 sets out to rectify this situation, not only giving you control of the machine as it hurtles around the various world championship tracks, but also allowing you to act as team manager.

Holding this post for a high profile car manufacturer like Ferrari must be a terrifying proposition, and thankfully the game does not stretch to the reality of being fired although after losing a few races resignation feels close at hand.

You must not only get your car to and from each race – allowing enough time for testing, modifications and travel – but you must be able to set your car up correctly for each different track.

A variety of alterations can be done to your car – the F186 model, a 1.5 litre turbocharged job producing more than 800 bhp. These range from turbo and engine adjustments, with the help of a dyno at Fiorano, right through to choosing different tyres for different wheels at Detroit.

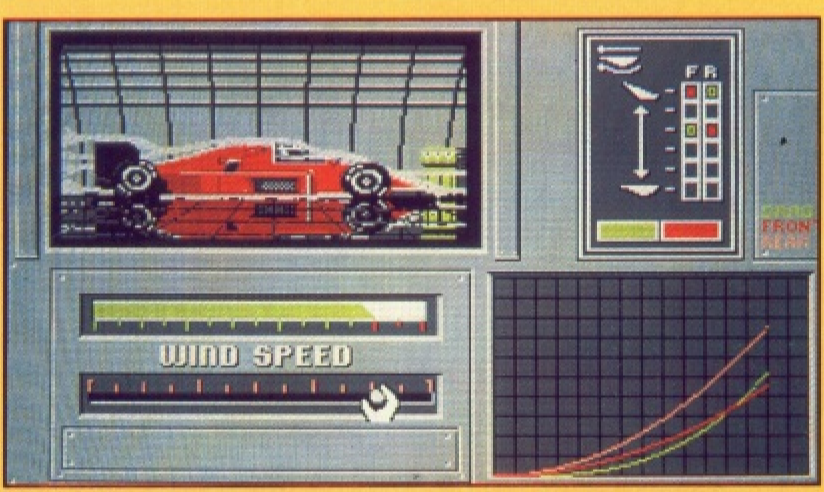
In order not to make the game too difficult to get into, a friendly mechanic will help you with advice when necessary.

The first few hours are spent at the test track trying to learn how to control the car.

Thankfully, you can choose whether or not to operate the gears manually, something which makes driving a little simpler.

Using the mouse, the right button accelerates, the left button brakes and pressing both down engages the clutch for drag starts.

Moving the mouse from left to right steers the car and it is this which presents the most difficulty. Unlike every other driving game I have played, instead of the front of the car pointing wherever you steer, the screen scrolls left to right and you control the driver's head.



Wind tunnel

This means that in hard corners you can be turning full lock and yet the car is in the corner of the screen. Although it is not too difficult to get used to, this small point is sufficiently annoying to make the first few attempts at driving around the track both frustrating and very slow.

After about 20 laps of the test track, you will find that cornering is not too big a problem. The real worry is keeping up with everyone else. On average, I was running about 15 seconds slower per lap than the seven computer-controlled cars – those of Mansell, Piquet, Senna, Prost, Berger and Alboreto.

This is when you should take the plunge and choose the Formula 1 car, with its gears, turbo boost and massive oversteer.

Changing from a supposedly Formula 3 car where the gears are automatically selected to a Formula 1 car with manual gears is not quite as easy as I had imagined. Even with the turbo-boost set at its lowest, the car still goes into corners far too fast, and unless you have been methodic enough to learn the track, excursions into the undergrowth are all too frequent.

Thankfully, unless you are actually in mid-race, these crashes do not affect you too adversely – apart from the seconds lost.

In a race, however, you can lose up to a couple of months if you crash badly – and two months can, at worst, mean four races – 36 possible points.

The graphics are good, but by no means exceptional. Attention to detail – track dimensions, and so on – were obviously considered more important than artistic graphics.

On the other hand, the instrument panel is small and lacks an accurate rev counter, which is a pity. The animation, too, is good. But as the game is written in C rather than assembly language, it is still not as smooth as perhaps it should be.

On the other hand, the sound – both music and effects – is excellent. A natty little tune plays while the game is loading. The sounds during the game are excellent ranging from the roar of a turbocharged Ferrari engine to the whirr of an air-powered spanner.

Ferrari Formula 1 is, when compared to everything else available for the Amiga, an excellent driving simulation. It combines an emotive subject with enough substance to provide many days of satisfaction that shoot-'em-ups or flight simulations could never give.

That is not to say the game is not flawed – it is. The most unfortunate thing about Ferrari Formula 1 is that it could have been THE definitive Amiga game. Unfortunately that accolade will have to go elsewhere.

Francis Jago

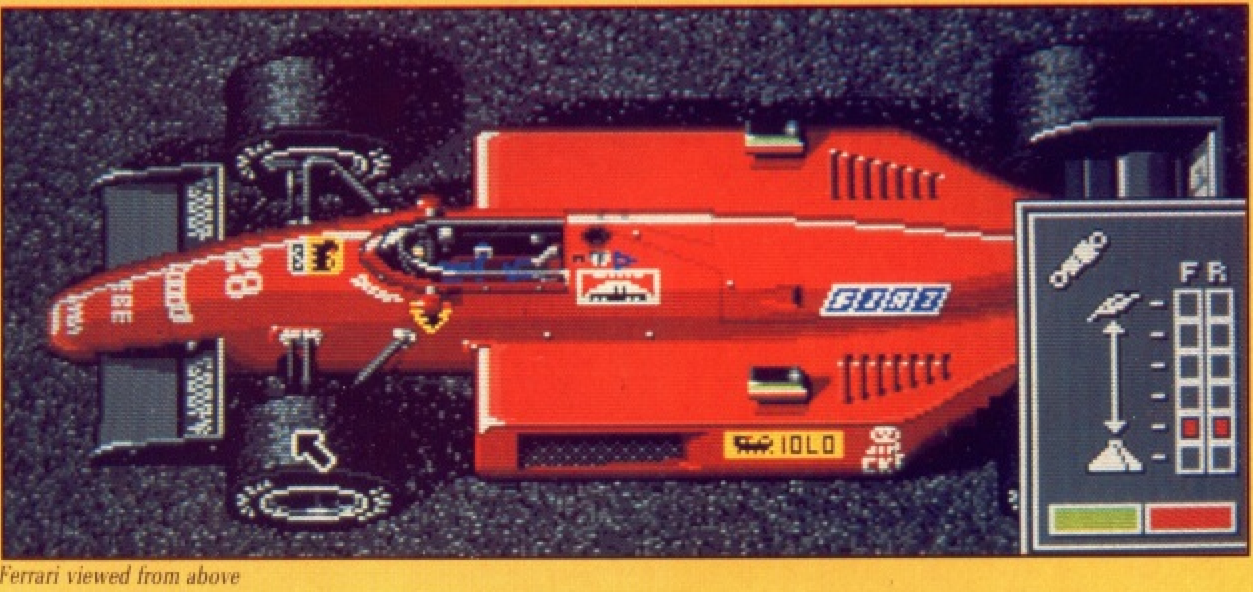
Ferrari Formula 1
£24.95
Electronic Arts

Sound
Graphics
Gameplay
Value

Overall – 65%



View from behind wheel



Ferrari viewed from above

STAR FLEET 1



Absorbing all the information on Star Fleet takes a while

WHEN you're asked to review a product which has a quick reference guide longer and more detailed than many games' full instructions, you know you've got a problem. Star Fleet 1 is a case in point.

Complete with a 68-page Star Fleet training manual, not to mention a 100 page officer's training manual, this is a combat simulation and role-playing game of mammoth proportions.

Set some time in the future, Star Fleet is a strategic war game between two opposing forces. Naturally enough, you represent truth, democracy, the American way of life, the universe and everything. The baddies are the evil and incredibly hostile Krellans and Zaldrons, empire builders on a galactic scale.

You begin as a cadet, still wet behind the ears, but hungry for every scrap of knowledge you can gain from the Star Fleet Officers' Academy. There, you will be given command of the training ship UGAS Republic. If you prove yourself a worthy enough student, you will have a choice of 36 starships to command.

Missions are many and varied, but all involve the location and destruction of enemy craft. A typical mission briefing might go something like this:

I. Effective immediately, you are to assume command of the USAG Duke of York. After relieving Captain Bertsch, you will proceed directly to the Antares III region.

II. You are hereby ordered to seek out and engage the forces of the Krellan and Zaldron Empires which have invaded the Alliance territory. In so doing, you are to deplete the enemy fleet sufficiently so that our main battle fleet can be assembled and defeat them before they can reach our colonies.

Each briefing ends with the specific requirements of the mission which include the number of enemy warships you must destroy and the time in which you have to do so. Finally you are given the number of starbases in the region.

If you can locate and dock with an Alliance starbase – providing they'll drop their defence shields long enough to let you through – you'll be able to refuel and re-arm your ship, as well as carry out repair work.

Your ship is controlled from 23 different command menus, which embrace 13 separate computer systems, as well as other functions such as emergency hyperspace, self-destruct sequencer and starbase status readouts.

Computer systems are used to control damage, navigation, shields, torpedos, phasers, tracter beam, transporter, internal security and reconnaissance probe launches.

Within each of these systems are various menus and sub-menus used for controlling that part of the simulation.

The amount of detail is almost bewildering. Take security for example: This can be compromised in one of three ways.

Enemy agents can get aboard, hidden in the supplies you pick up at starbases. Prisoners, captured during battle, can escape and wreak havoc throughout your ship. Finally, agents can be beamed aboard if their ship is within two sectors of yours.

Internal security control gives you the latest information and allows you to start or stop searches to apprehend intruders. You can also opt for a maximum security deck situation, in which one deck is given blanket cover at the expense of all others.

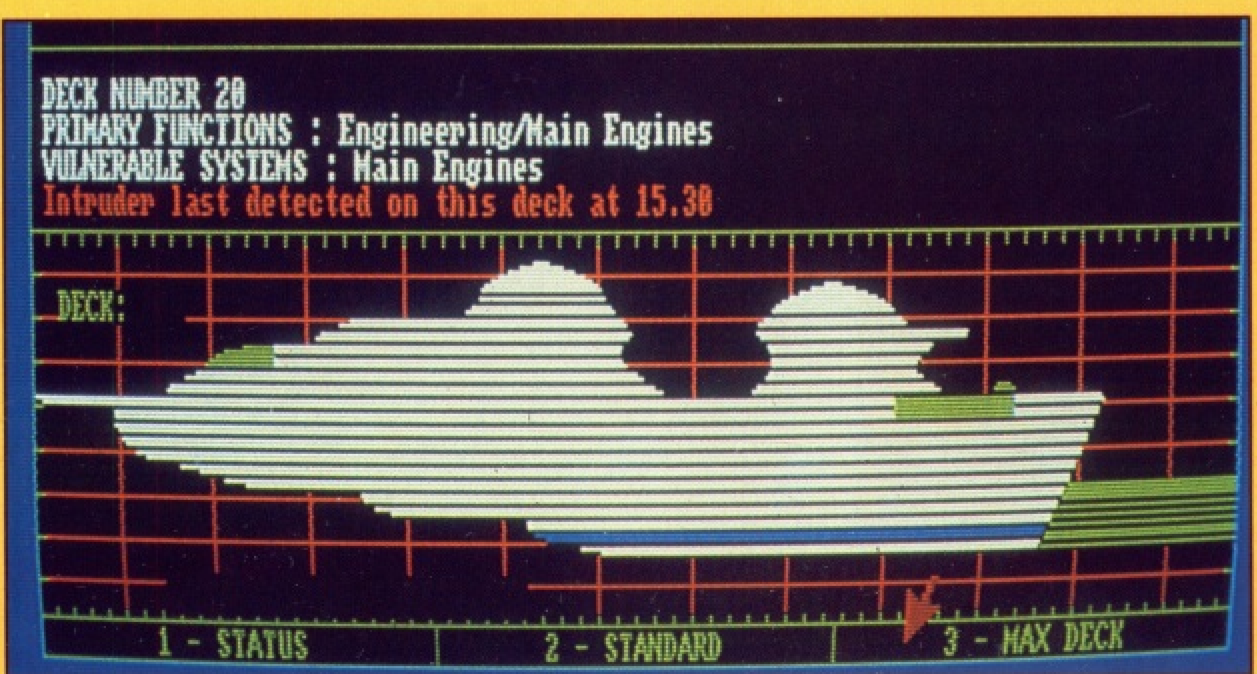
Should you outguess the villain, and he goes on to this deck, he will almost certainly be caught, or at least prevented from sabotaging any vulnerable systems.

The same attention to detail can be seen throughout Star Fleet 1. Whether such a mass of information, documentation and displays amounts to a great game, you could only say after spending plenty of hours on the bridge.

Certainly the package is impressive, the depth of the game unquestionable, and the scenario one that most gamesters hold dear to their heart.

Although the lack of graphics may put many off, this shouldn't necessarily deter Amiga owners from considering the package, especially if they like pure simulations or role playing games. But be prepared to work hard at getting the most from this game.

David Bishop



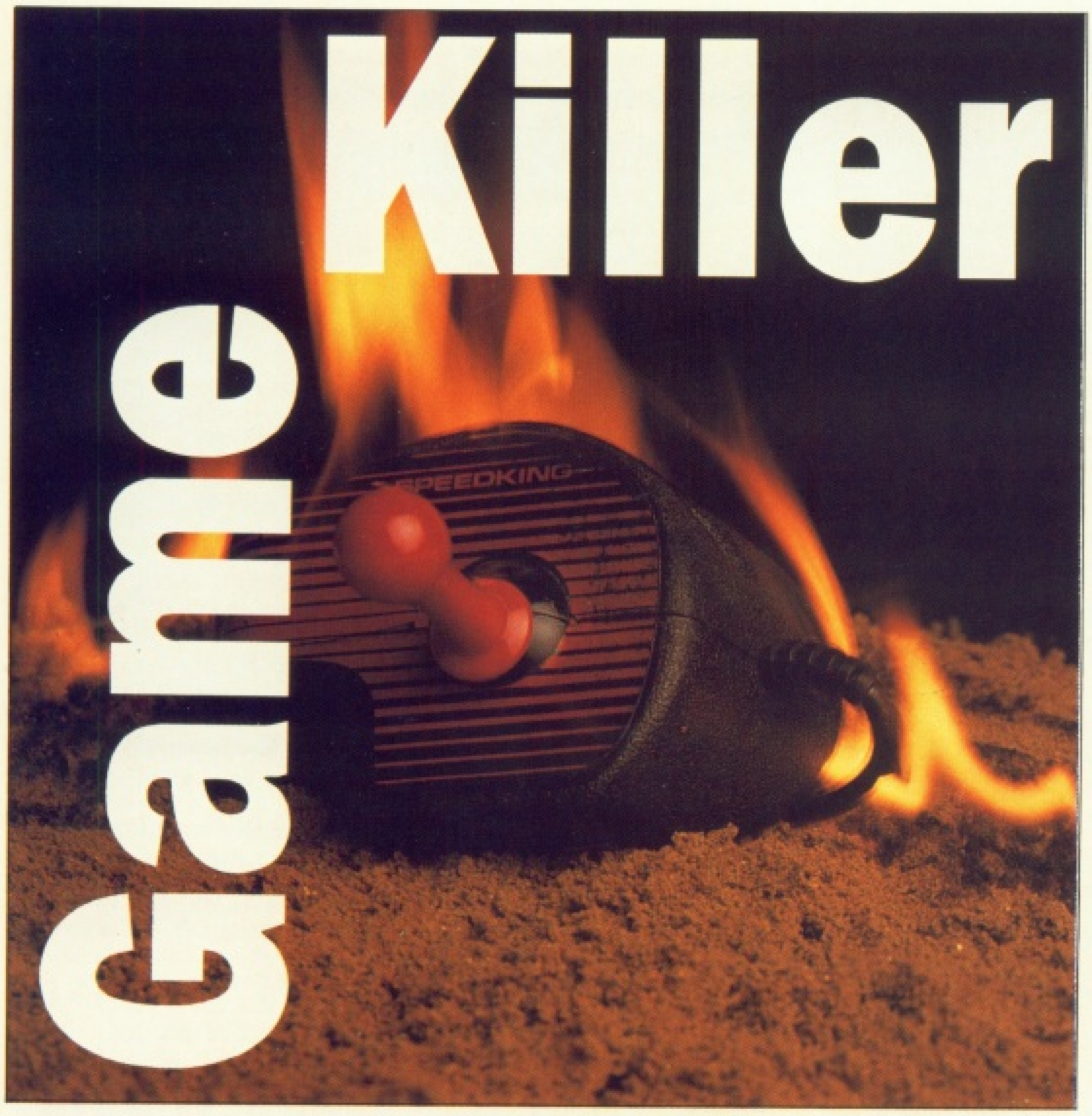
Despite being mission-based Star Fleet owes much to early Star Trek games

Star Fleet 1
£24.95
Electronic Arts

Sound
Graphics
Gameplay
Value

Overall – 64%

Game Killer



Max "The Hacks" Tennant is the master of game play. Whatever the game he'll win at it, fair means or foul – often with a little help from his friends. If you have a tip for a game send it in. For every one we print we'll send you a game from our goodie drawer – together with a Konix Speed King joystick

THE first friend of Max the Hacks is Adrian Curry from Firebird. An ace games player, he has turned his attention to Bubble Bobble, and presents the advanced Bubble Bobble Player's Guide. So if you have been bitten by a Benzo, bounced on by a Bonnie-bo or bowled over by a Boa-boa you need some Amiga-type help.

On almost every screen two special items will appear. The first will be worth loads of points and the second will be a magical object. Knowing which object does what is the key to points prowess.

You don't need a sweet tooth to appreciate the candy stick. Pick this up and kill all the baddies. The huge fruit which falls down the centre of the screen is worth between 10 and 30,000 points. Any bubbles on the screen will turn into the same fruits worth 500 points each, so make sure you blow lots of bubbles before killing the last baddie.

A similar magic item is the treasure chest. The huge fruit is replaced by a diamond worth 50,000 points.

The potions are tasty – upon quaffing a bottle of the stuff the screen will be decorated with a special type of fruit. You have to collect as many as possible within a time limit. If you get them all the player who gets the most scores a 100,000 point bonus and the runner up 50,000. If the players get half each they both get 100,000 points.

Your bubbles are your main defence. Bubble up sweets come in three flavours – yummy yellow, perfect purple and bubbly blue. The first allows you to blow bubbles at twice the normal rate and the purple sweets increase the range of your bubbles. Bubbly blues are useless, a quick chomp to no effect. The best of both worlds, dropping yellows and purples is known as "Super Bubble Up".

UMBRELLAS are bella. Grab the open brolly to allow Bub and Bob to fall down either three, five or seven screens. Very useful for avoiding the nastier screens.

It helps to get cross when the cross in question is a magic one. The blue water cross fills the screen with water, killing all the baddies on that level, the purple lighting cross calls down several bolts of lightning to smite the evil monsters. The red cross sets either Bob or Bub breathing balls of fire; unfortunately this ability expires with the end of the level.

The teapot can be the best drink of the day. A red teapot bestows super bubble up on whoever drinks its contents dry. The next item is more than a storm in a teacup. Get it to release a storm to destroy all your enemies. Last, and certainly least, the blue teapot, in keeping with its confectionery cousin, does nowt.

The secret levels are something which only more experienced players should look for. If either player manages to survive more than 20 screens without losing a single life, a secret door will appear instead of a magical item. Enter this portal to travel to one of the secret screens.

Then if you manage to survive another 10 screens without losing any lives another door will appear. This can happen up to four times, the final one being a teleport of 20 levels. The writing at the bottom is more than just a scrawl – try pausing the game and decoding the secret message.

Two's company, and Bubble Bobble was designed as a two player game, so although one player can just about finish it is far, far easier with two. To see the end and secret screens most people use a kamikaze tactic. One player must do all the work while the other should save his skin and hide from trouble. If Baron von Blubba should appear the kamikaze player should try and collide with the Baron to save his friend.

If you ever come across a monster

▶

◀

who won't come out of his hiding place stand on the platform directly above his head. The baddie in question will come out to find out who is making such a racket on his roof.

LISTED below are some of the screens which have proved to be very difficult. The hints and tips here should allow you to bounce where no brontie has bounced before.

Level 13: Fall through to the top of the heart and wait for the water bubbles to come up. Pop these to flush the Bubbas out.

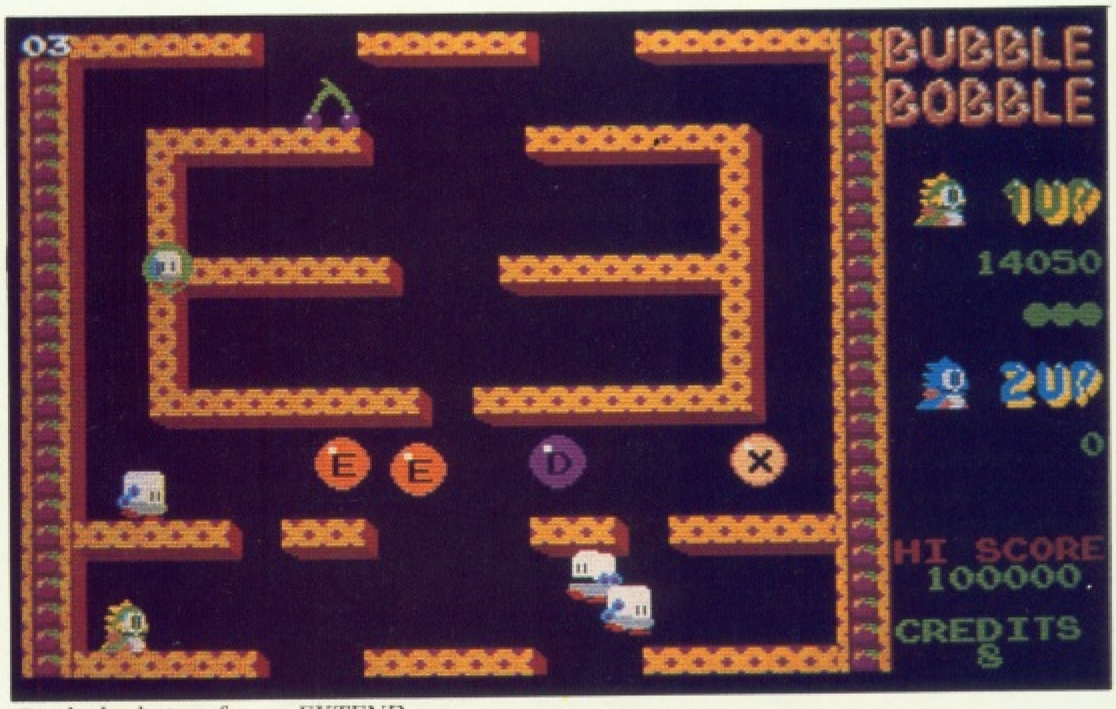
Level 32: You have two options on this screen – either wait to see if a magic item appears, or just time it so that all the Boa-boas are moving away from the centre when you fall down the hole.

Level 42: A really great group, famed for Mark King on bass guitar. Nothing to do with Bubble Bobble.

Level 44: Stand on the far left or right ledge and bubble the Grumpies, jumping to avoid their fireballs.

Level 63: A tricky one. You have to jump from your own bubble on to the first ledge. Repeat this to get to the second ledge, and again to get on to the top one. Once up there stand on the ridge and bubble away.

Level 70: Fall through on to the torch and work your way down to its bottom ledge. Once there stand as close as you can to the edge and head butt the first fire bubble which comes overhead. Then it's chocks away Ginger, Goodbye bonnie-bos.



Catch the letters for an EXTEND

Level 71: To get to the monster trapped in the pit, jump on your own bubble and bubble through the wall.

Level 72: To get out of the pit stand with your back to the wall and jump on your own bubble, bubbling all the way. You will probably have to try this several times to escape.

Level 88: You will need to help the fire bubbles along when they get stuck. To do this just blow loads of bubbles around them and gently nudge them along – the fire bubbles should resume their course. Once over the heads of the baddies, just pop them and on you go.

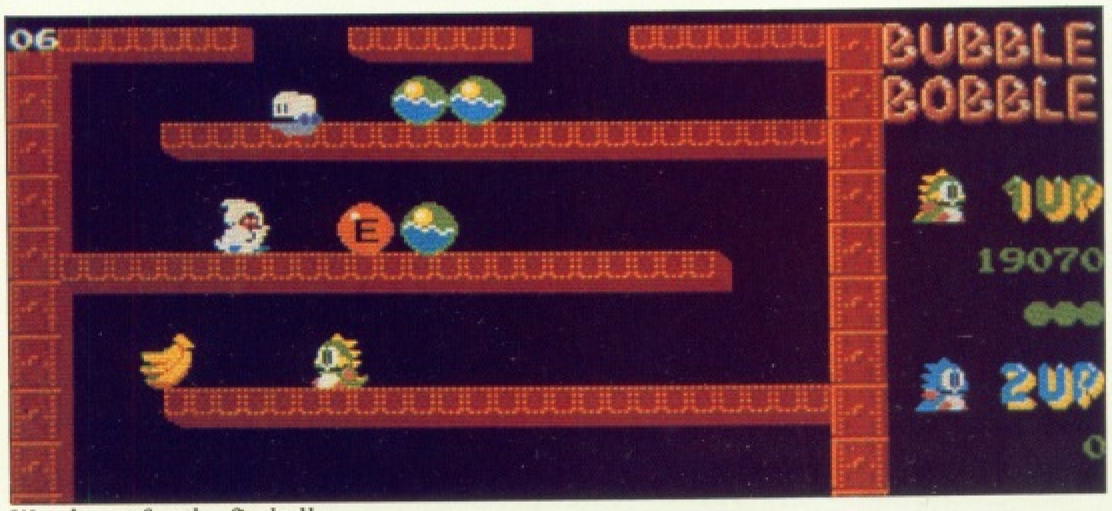
Level 95: Bubble up the sides of the screen and once you reach the top stand on the ridge and bubble those baddies.

Level 96: Wait for the invaders from space to get stuck in the pits then just free-fall close by and bubble them one by one.

Level 99: Bubble the Blubbas through the walls and drop fire on the bonners. Then return to the bottom of the screen and jump on your own bubble, up past the Boa-boa. When you are near the top, pop your own bubble and move left. Free fall down and bubble the Boa-boa as you pass.

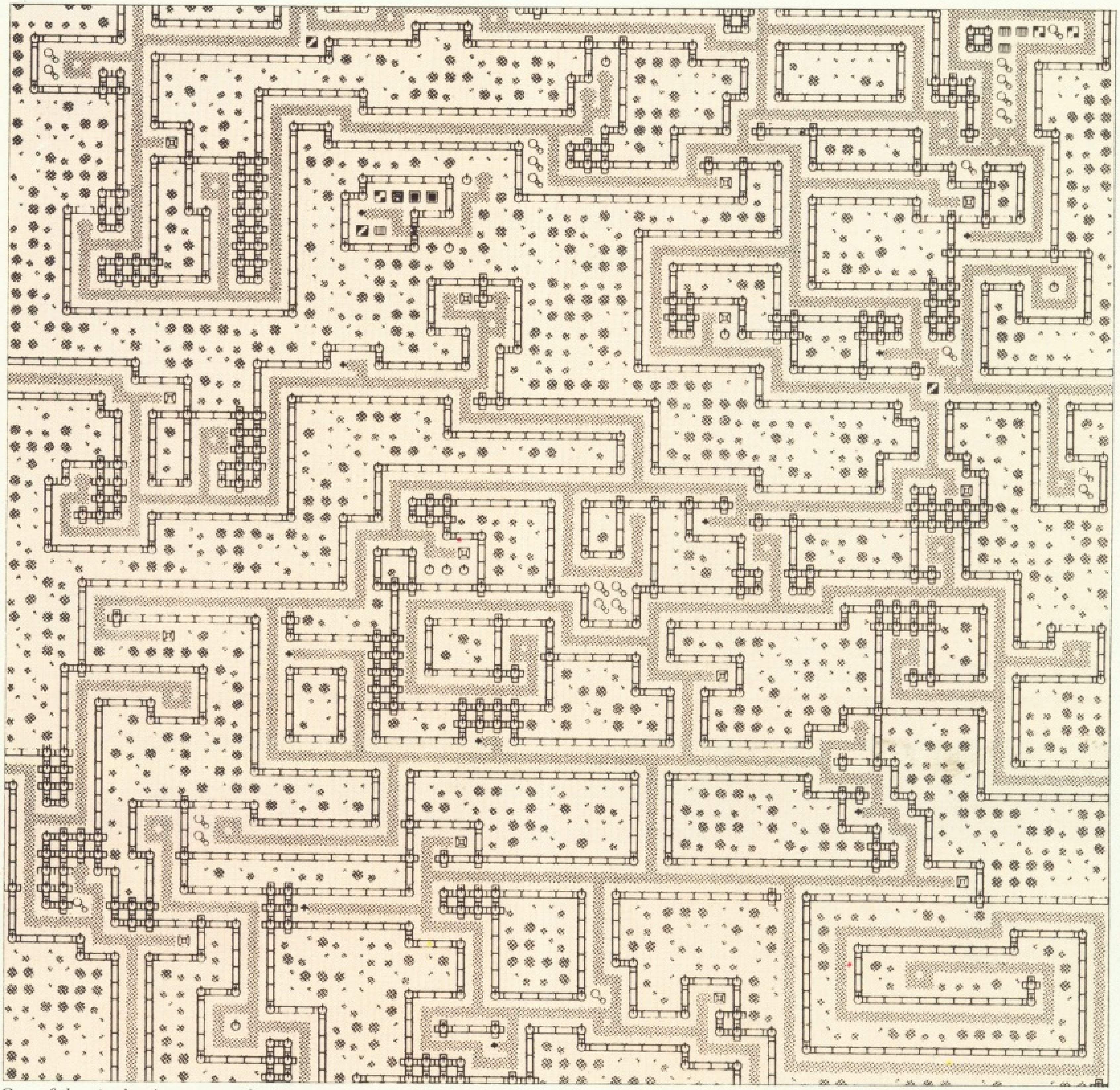
Final level: The first thing you should do once you reach this screen is grab the lightning potion at either the top left or right corners of the screen. You will then be able to blow lighting bubbles, the only thing which can harm the King of the Bonners.

The best tactic to finish off the giant Bonner is to jump on your own bubble which will float up the side of the screen. While you rise up you should blow bubbles, then, once you reach the top, fall down and pop the bubble chain which has been created. You will have to do this a couple of times but once the King turns blue he is close to death. Then once the Bonner is bubbled it is every brontosaurus for itself and "pop that bubble", because it is worth *one million* points to whoever gets there first.



Watch out for the fireballs

TWO hints from Phil Sinclair are the cheat modes for StarGlider and Goldrunner. To become invincible in your AGAV take the velocity down to zero, press f1 for a



One of the single player maps for Firepower

fixed crosshair and press the backspace to pause the game. Type "js arg s", then press backspace again and type "js arg s" again. The instruments will all go to fixed levels to indicate that you are in cheat mode. Pressing Z will put you in the shape editor while P tops up your missile collection.

Finally a hint for all Goldrunner players. You can make your ship invincible by running the first ship off the building and pressing f5. Then press I to pick up a special bonus.

Thanks Phil, your joystick is in the post.

ANOTHER friend of Max the Hacks is Sam Littlewood. A Unix hacker by day and Amigaphile by night, Sam is responsible for the Firepower map you see here.

He also offers some great advice for Arkanoid fans. Pause the game and type DSIMAGIC. A cylinder will roll down the screen. Catch it. Now getting the cylinder you want is a doddle. Just press the appropriate key. L for lasers, c for catch and the Vaus will be freed. Really lazy players can press F for final screen and get straight to the end. Perhaps F stands for screen fifty free.

- Building
- Building
- Prison
- Start
- Nissen Hut
- Red Cross
- Fuel Dump
- Bunker
- Gun Emplacement



Washington Diary

The 1988 USA Amiga developers' conference was held in Washington over bank holiday weekend, April 29 to May 1. Dave Parkinson of Ariadne Software was there and reports

Preliminary – Thursday April 28th

KENNEDY Airport NYC is absolute murder. Non-USA residents have to queue for ages at passport control, then go into customs, which is an absolute shambles and takes even longer. I discuss Kennedy later with an Amigaphile professor from Utrech University – we agree to have one airport somewhere in Europe, with one entry-point marked "AMERICANS", with a small notice under it saying "Remember Kennedy!". An American friend later tells me that he sympathises, but not to bother because Heathrow is pretty well like that already.

CONFERENCE registration starts at 7am next morning – this is about midday for me and the others from Europe, so we are the only ones getting up at a sensible and normal time for a programmer.

We stand in line while bleary-eyed but willing Commodore people hand out T shirts, schedules and conference notes – real Gail Wellington (General Manager worldwide software and product support) specials consisting of an enormous binder stuffed with technical information. I wonder about paying excess baggage to cart it back.

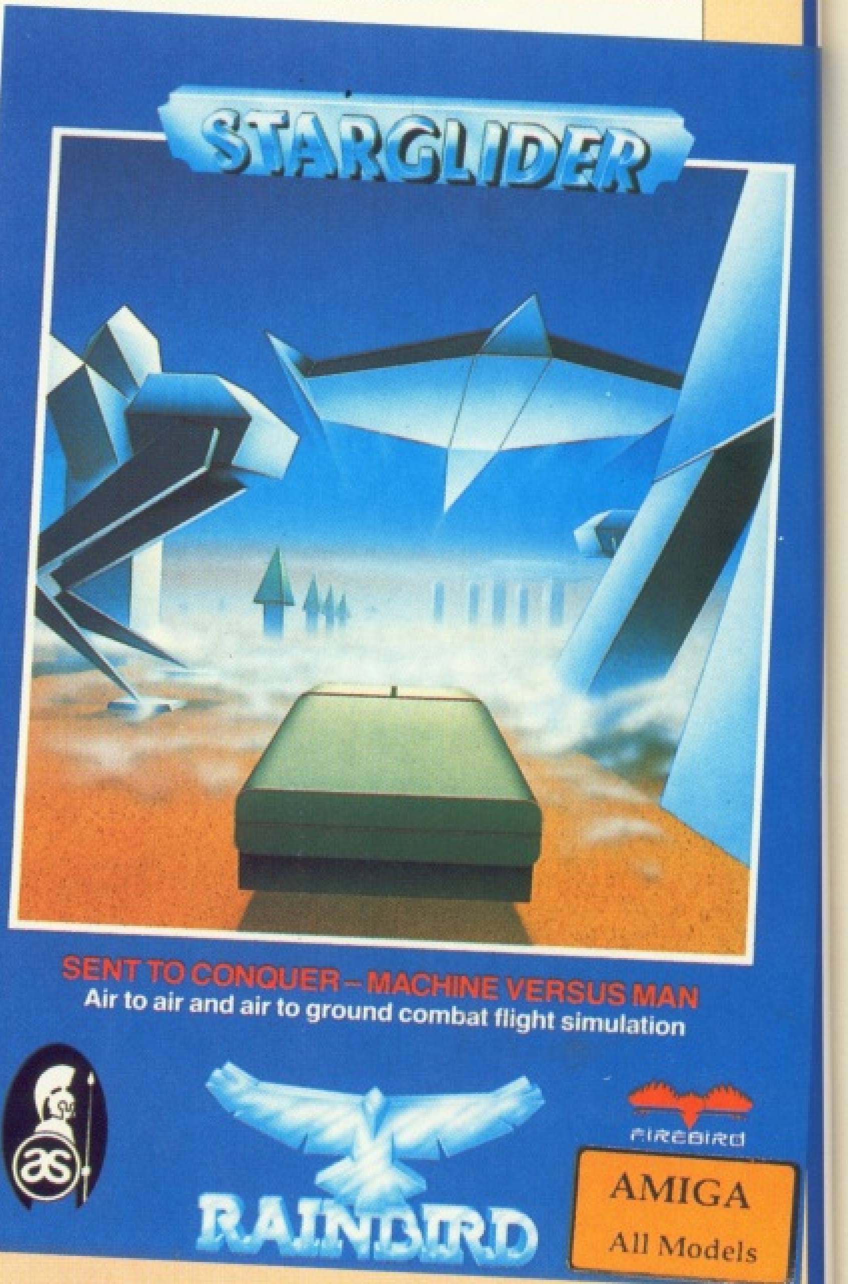
Gail says hello to everyone and introduces representatives from the different countries who are attending – in all there are more than 300 of us there, of whom a good proportion come from outside the USA, which is all rather encouraging. Keynote speaker is Gail's boss and the man who lead the original A2000 design team, Dr Henri Rubin. Henri previews the new Amiga developments to be discussed in detail later in the conference.

The main point he makes concerns Amiga multi-tasking – this is something which other computer companies are falling over themselves trying to get working, but which the Amiga has had for years. Is current Amiga software exploiting this capability properly? Henri clearly feels that it isn't, and I must say that I agree with him.

The conference splits into three concurrent sessions. The first three are an introduction to Amiga for new programmers, something on the Copper for more experienced ►

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Starglider is the all-time classic game created by Jez San for Rainbird Software. Its superb 3D vector graphics, digitised sound and amazing playability created a storm when it was first released on to the unsuspecting Amiga market.

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◄

programmers, and something on A500 peripheral design for the hardware freaks. I can only report on sessions I go to – my multi-tasking isn't all that wonderful, sorry – which in this case is the Copper talk by Jim Mackraz.

If you ever make it to an Amiga conference, take any chance you get to listen to Jim Mackraz. Jim knows the Amiga really well, having taken over Intuition from R.J. Mical after version 1.1; he is also a natural speaker, informative and very amusing.



ON this occasion, Jim's topic is how to pull tricks with the Copper without upsetting the rest of the system, by setting up a "user Copper list", to be integrated with what the graphics libraries want to do with the Copper. This turns out to be quite straightforward, but not to agree too well with the documentation (sigh). Jim provides an example program which does it right.

The trouble is that tricks with user Copper lists can upset graphics co-existing with Intuition's idea of multiple draggable screens, with the result that dragging down the last screen can produce garbage. This seems to be non-fatal, and will be fixed in version 1.4. In the meantime it may be better to reserve Copper tricks for your own private non-Intuition ViewPort.

Jim goes on to talk more about the system's use of the Copper, and about how to use Copper lists to implement efficient double-buffering on the Amiga. This turns out to be trickier than one might like – the optimum solution presented involves setting up two alternative Copper lists for the two screens and swapping between them on the vertical blank using a low-level graphics library function called LoadView(), plus setting up a Copper list interrupt to signal your task when it's safe to resume drawing.

THE second talk starts with a general presentation of recent developments in IFF by Carolyn Sheppner of CATS, who should be known to UK Amiga developers from the official IFF Fish discs. She runs over the most recent developments, and considers a few problem areas, such as uncertainties remaining in representations of overscan images, and of colour cycling. She then hands over to Lattice to discuss the new PGTB (ProGram Trace Back) form, then to Sparta to discuss ANIM. PGTB seems like a very neat idea.

TO use PGTB you link with a new startup module so that the Amiga doesn't just give a guru alert if

►

Glossary of terms

AmigaDoS: The Amiga's operating system, which apportions jobs for the hardware to do when it receives a command from a program. It looks after the housekeeping of the system.
ANIM: A file format which has become accepted as the standard for showing animation frames. It allows screens to be compacted and then replayed at speed.
Autoboot: A process which allows the computer to start-up (boot) without using a Workbench floppy disc. The computer will autoboot from ram, a hard disc or a network.
Barrel shifter: A type of register in the computer which can multiply or divide by two. This can be used to change the graphical results produced by different numbers.
Binddrivers: A program which checks which peripherals are attached to an expanded Amiga. It is necessary for connecting a hard disc or network.
Copper: The Amiga's graphics co-processor, which handles a good number of the drawing and colouring functions. It needs its own special machine code instructions.
Double buffering: Flicker can be avoided by drawing a screen in memory and then showing it complete. While the complete screen is being shown the next one is drawn in memory. The two are then swapped and the process continued.
Fish discs: Fred Fish is a Texan who compiles Public Domain (PD) discs. These contain a variety of useful programs and demos.
Guru: The error message system used by the Amiga. A Guru Alert provides system information when the machine crashes.
IFF: Interchange File Format – Commodore's standard format for storing sound, graphic and text files which aid compatibility between programs. By keeping to Commodore guidelines developers can make sure that files produced with their programs can be used by future programs from other manufacturers.
ILBM: Interleaved BitMap the screen format used by IFF, developed by Electronic Arts for Commodore Amiga.
Intuition: The part of the operating system the programmer uses. It chops up the jobs it is given by the programmer and sends them to AmigaDos. An instruction like OwnBlit() is an intuition command.
Kickstart: The program which sits inside the computer and comes to life when you switch it on. This loads Workbench.
Multi-tasking: A special feature of the Amiga which allows it to run more than one program at once. Not all Amiga programs co-operate with this.
Overscan: The standard Amiga screen has a maximum resolution of 640 by 400 pixels (dots). This is all you can see on a screen but some applications – notably Desktop Video, need the pictures to go off the edge of the screen. This is called overscan.
Vertical blank: A television picture is not displayed all the time. The vertical blank is the time between frames being shown. If the computer tries to draw on the screen during the vertical blank the result will not be seen until the next frame. Frames are drawn at a rate of 50 per second.

◀

something goes wrong. Instead it writes out a file containing a PGTB form, then gives a guru alert.

The PGTB form holds debug information such as seglist addresses, registers, parts of the stack, memory status, and any special data obtained by calling an application-specific dump routine. The user can then send this file back along with the usual bug report ("Er, it keeps going wrong"), so it can be attacked by a variety of debug and trace back utilities. This could be a real help in program testing – let's hope it catches on.

The situation as regards the ANIM form is less satisfactory. ANIM is really rather a mess. The problem is that it has been allowed to evolve into a de-facto standard, while in fact it contains two major problems. Firstly, it uses an ILBM form to contain what is actually delta information, which is nasty. Secondly, ANIM should not in fact be a form at all – it is a succession of IFF objects inheriting common properties, which should be dealt by seriously under-used IFF structure called a LIST.

THE afternoon starts with another "all together" session, this one on Commodore's new hardware and software developments, presented by Jeff Porter and Andy Finkel. Since these have been reported elsewhere, I won't go into detail.

FOLLOWING the new Commodore products presentation we form an orderly queue (ho ho) and shuffle out to pick up copies of the official conference disc pack. These include gamma test versions of Workbench and Extras 1.3, plus three discs of sample programs and so on from the conference. We then split into three groups again, and I settle for a session on the new A2024 high-res monochrome monitor.

This session is hosted by Hedley Davis, the Amiga hardware engineer who developed the A2024, aided by Jim Mackraz. Hedley starts by showing off the A2024. This is a really nice-looking bit of hardware, capable of producing a very sharp display up to 1008 x 1024 PAL non-



interlaced four-level monochrome. It looks great. Together with the new fonts it should help a lot in areas like desktop publishing.

The way the monitor works is quite simple. You set up an enormous bitmap – say by opening a big Intuition screen – which you then render into precisely as normal. The system outputs this as four successive frames – or six frames if you want to avoid cycle stealing by the PAD. The monitor then puts them back together in an internal frame store which it outputs as a very high resolution non-interlaced image.

Note that the effective full-screen update-rate is reduced to a quarter (or a sixth) of normal, so fast animation could be a problem. It appears quite adequate, however, for normal output. Note also that very high-res screens take a lot of memory, so you need at least a megabyte total on your machine.

The monitor will really come into its own when we get the new extended chip set which allows up to a megabyte of chip memory.

Full software support for the A2024 will be in Kickstart 1.4; meanwhile it is possible to get it to work on 1.3 with a fair amount of patching. There is an "emulation" mode where an A2024 is faked on a current monitor, with the display lurching violently when you move the mouse out of the current visible area. This looks horrid, but should be useful for software developers who don't have A2024s.

AT this point I decide to go to the session on new Kickstart and Autoboot – Amiga start-up and expansion.library is something I've never really looked at, so perhaps I might learn something. In the event I don't learn much, as the session is not particularly successful. Still just one dud in a day isn't bad.

The session starts well enough with Bart Whitebook (autoboot software) giving an overview of the boot process. Joe Augenbraun (hardware) then takes over and gives a very brief description of how to set up a boot rom. Bob "Kodiak" Burns (recoverable ram disc software) then manages to confuse me completely.

The basic idea seems reasonably simple. First, expansion.library looks at each board in turn, and if it recognises a valid rom it copies it to an "image" somewhere in ram, and calls a "rom/diagnostic" vector which allows the rom to patch itself to reflect its current ram position if necessary.

Next a new library is invoked, called romboot.library. This checks though the expansion board rom images looking for flags CONFIGME. If found, it searches the rom image in question for a valid "Resident" structure; if found, it calls a routine InitResident() allowing the board's driver software to initialise.

This allows the board to get its Exec device or whatever sorted out, in a neater way than loading off a boot floppy using the old Binddrivers program. It also gives it an opportunity to say it wants to autoboot. It does this by linking a structure called a BootNode into a linked list maintained by expansion.library.

Later on, the Dos is woken up by something called strap.library. This first of all checks for a boot disc in DF0: – if so, it boots off this, so that it is possible to overide auto-boot to run a game or something. Otherwise it tries to boot by calling the routine specified by the highest priority BootNode. This is handled by calling a romboot.library routine called RomBoot(). If both fail – if it can't find a floppy or a rom that wants to boot – it puts up the old "please give me a Workbench" image. Note that the Dos brought up by RomBoot() will normally be AmigaDos. It doesn't have to be, so it would be possible to use this to bring up an alternative Dos, say if you were booting off a network.

As I said – the principals are simple, but the details are tricky, particularly when it comes to how

this process is gimicked by Kodiak's recoverable ram disc.

FINAL session for the day is on low-level blitter access, presented by Tom Rokicki of Radical Eye Software, author of Amiga TEX. Hitting the blitter hardware is very easy on Amiga. The simplest – not necessarily the best – method is to call graphics library routines OwnBlitter() then WaitBlit(), hit the blitter to your heart's content, then give it back using DisownBlitter(). Note that this should be followed by another WaitBlit() if you are going to examine the blitted data. This gives you maximum blitter performance without messing up the OS.

Getting access to the blitter is simple; using it once you have it is not so easy however. The problem is partly that the documentation is rather sparse, and to make life more interesting, just a teeny bit wrong in places. More fundamentally, the problem is that the Amiga has a Word blitter which blasts 16-bit words around in chip memory very quickly.

But what you really want is a Bit blitter, capable of transferring an a bit pattern. The way to simulate a Bit blitter using a word blitter is to make use of the barrel shifters attached to two of the inputs.

In order to sort this out, Tom has done a fair amount of blitter research – including some graphics.library disassembly – and has written a really nice PD program called BlitLab for easy experimentation with the blitter.

Tom's BlitLab demo is followed by an interesting question session. A lot of these involve use of the blitter by graphics.library, which Tom passes on to graphics author Dale Luck. One question concerns the use of alternative blitter access mechanisms QBlit() and QSBlit(). These allow you to queue blitter requests as BltNodes, to be processed as soon as the blitter can get round to them, optionally in a beam synchronised manner.

A further question to Dale is why the graphics.library doesn't offer much in the way of multi-channel blits such as ANDing or ORing two RastPorts together. The answer is that handling the "arbitrary move" problem through the layers logic is so complex that two blitter input channels get tied up doing it, using only one left over to the application.

This discussion leads me to understand the graphics library rather better. The program doesn't have to tackle the usual problems of writing lots of assembler to move stuff around in memory as fast as possible, since this is looked after by the hardware.

A further question Dale gets asked concerning speed relates to the function BltBitMapRastPort(). This is very useful, since it allows you to set things up using the blitter in your own private off-screen BitMap without worrying.

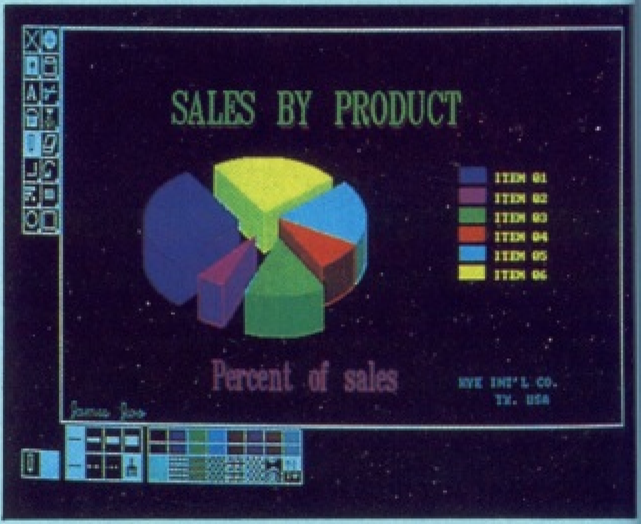
Dale admits that this was put in late and done by calling a load of functions he already had written. It could be made faster, and he hopes to look at this for version 1.4.

By this time exhaustion is setting in fast – the session comes to an end around 6.30, 11½ hours after registration. Phew.

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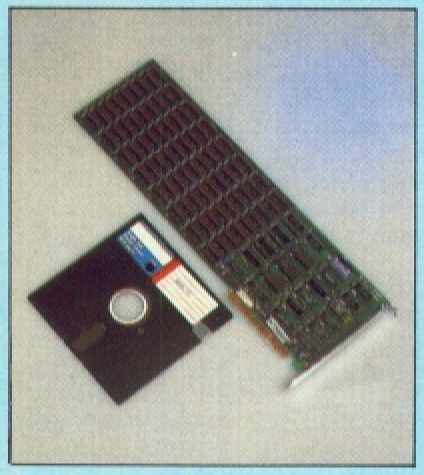
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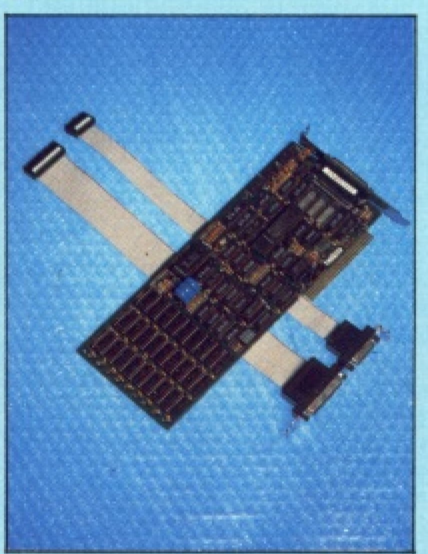
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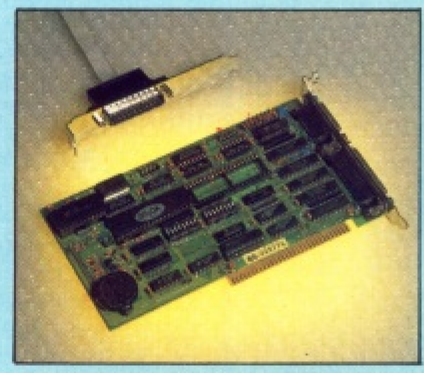
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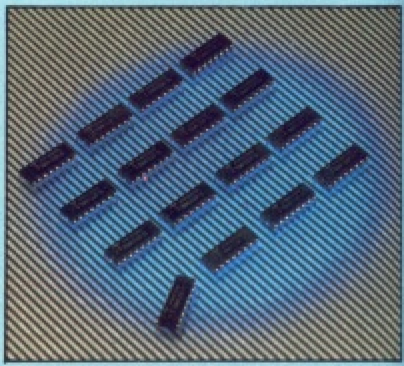
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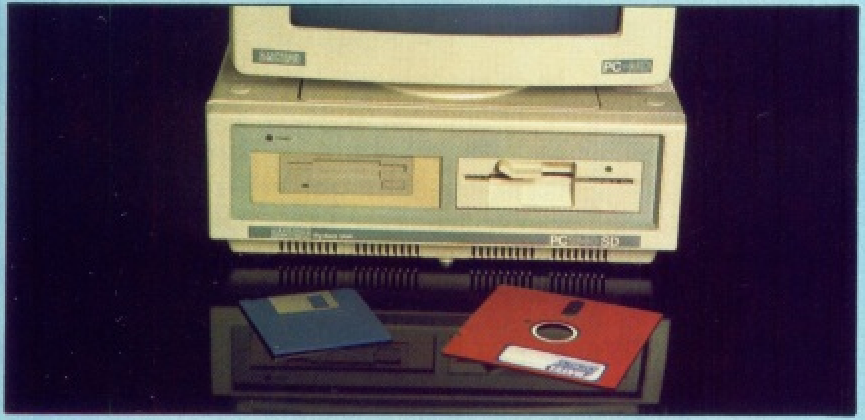
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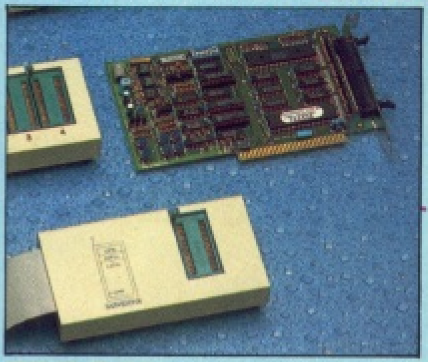
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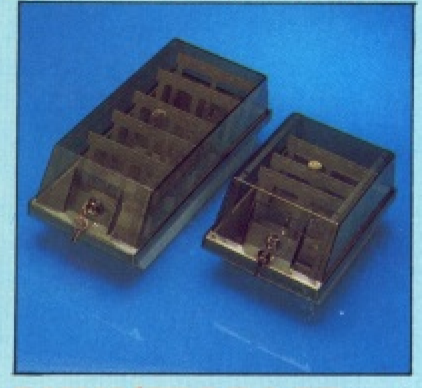


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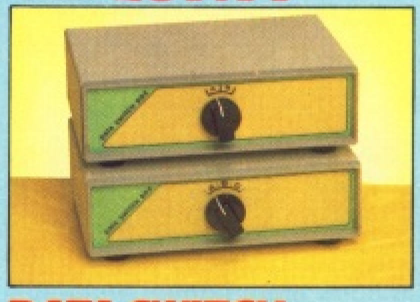
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Basic strikes back

Mark Luckham finds that a grown up computer merits an adult approach to programming. Structure reduces the bugs and the LET statement returns

BACK in 1963 at Dartmouth College, two gentlemen along with willing undergraduates designed and implemented a language that would be easily grasped by beginners as an aid to learning Fortran. Those gentlemen were John Kemeny and Thomas Kurtz, and the language was Basic, now the standard language supplied with nearly every micro.

Over the years Basic evolved, and due to memory restrictions on the early home micros its authors took short cuts to make it completely hardware-specific. A program written in one dialect of Basic stood no chance of running on a different machine.

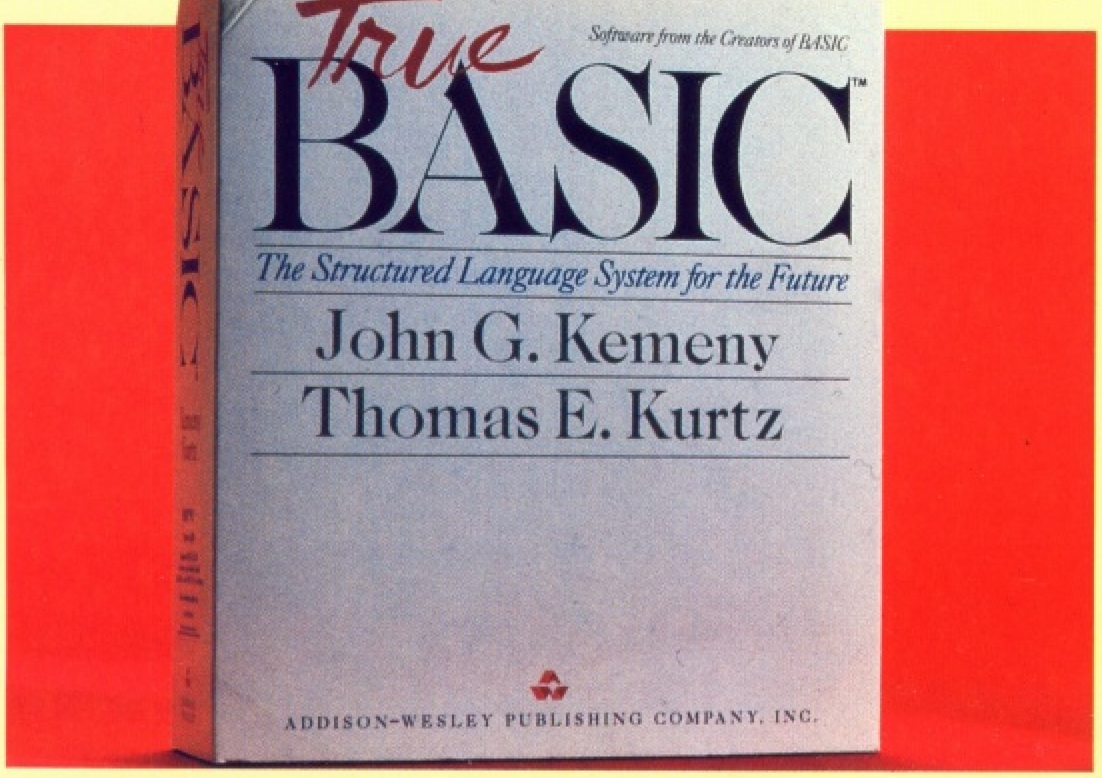
Kemeny and Kurtz watched this process with some horror, and finally decided to do something about it. True Basic was the result, a portable language that they hoped would be the structured language system for the future. It was already available on the PC and Mac – the Amiga was the next in line to see the light. Adam Webber was the actual author of this version, though he has received little credit for his work.

True Basic is certainly a big enough package, consisting of a language disc, a 307 page users guide, and a 331 page reference manual. The users guide will doubtless come as something of a shock to those unfortunates who are used to Basic manuals that Commodore normally supplies with its machines. It is both clear and helpful for the beginner, with many tutorials, and yet contains vital machine-specific information that all standards of programmer require.

The reference manual is the same for all versions of True Basic, and as such has the irritating habit of divulging juicy little secrets, only to point out that your version may be different. Thus it isn't as portable as True Basic Inc would like you to think it is.

A typical True Basic display consists of a source code window, a command window, and an output window. The last two are optional and can be opened or closed at will. If the output window is not defined during output, or has been closed, then output goes to a full screen, the contents of which are lost when the program is stopped or ends.

Once a program has been entered the editor can be brought into play to cut, copy and paste sections which are marked by clicking and dragging with the mouse. Alternatively the function keys can be used to mark blocks, as well as perform other useful editing tasks such as moving to the command or output windows, moving to the start or end of a program, and deleting characters or the line to the right of the cursor.



In a similar word processing vein, it is possible to search and replace specific words, or parts thereof, in the program. This operates from the cursor position onwards and will find key words as well as variables.

An interesting feature is the ability to mark a part of the program, say just a couple of lines, and delete the rest – useful if you are trying to build up a subroutine library, as the selected lines can be saved to disc as one.

When entering a program it will normally be displayed justified to the left of the source code window, but this can be changed to show the structure of the program. Select the Do Format option and watch as the structures are indented, key words are changed to upper case, and REM – or as they are referred to here comment – lines are straightened out.

As with any modern Basic, True Basic does not ordinarily use line numbers, but they can be added at any stage in program development, and full line renumbering is also available The maximum number of characters that can be used on one

line is 32,000, which is a far cry from the 255 C64 days. The largest line number as well is impressively high You can have line numbers running up to 999,999.

Large scale numbers indeed, but it doesn't stop there. Numbers have 14 digit accuracy, the maximum string length is over a million characters, variable names can be 31 characters in length, the maximum record size is over 16 million bytes and, quite astonishingly, the maximum file size is four trillion bytes. In theory. I didn't have a file that could test that claim. Roll on optical discs.

As far as general structure goes, Kemeny and Kurtz have attempted to make the language as structured and orderly as possible.

Going back to the line numbers. Concatenation is not allowed in the source code, and there can only be one command statement to each line.

So a program containing an IF..THEN..ELSE..ENDIF construct would have to have IF..THEN.. on one line, ELSE all by itself on another and ENDIF again all alone.

SELECT CASE isn't something that many Basics support, but as you might have guessed, it is here. This is similar to IF..THEN..ELSEIF as it lets you try several tests and execute a block of statements, depending on which test fulfils the conditions required. When assigning variables the almost forgotten LET becomes compulsory. It isn't optional.

Neither is using the variable name in conjunction with a NEXT statement. You must specify the variable name. What is interesting is the option to jump out of a loop before it has finished. There are few Basics indeed that will allow you to do that.

Also in the field of loops can be found DO..LOOP, which simply executes endlessly, unless it finds an EXIT DO statement in there somewhere. DO WHILE..LOOP, DO UNTIL..LOOP and combinations thereof are far more flexible, and will execute the loop while certain conditions are met or until they are not. And if no conditions are likely to be met then there is always EXIT DO to save you from the programmer's nightmare – the endless loop.

Your friend and mine, the procedure, has of course not been forgotten, though it has undergone a name change. Functions can be defined and then CALLed, as can

Test	True Basic	Amiga Basic
1	0.06	0.04
2	0.22	1.94
3	0.68	3.94
4	1.02	4.64
5	1.16	5.04
6	1.7	8.86
7	2.6	3.76
8	11.5	17.68

Using standard Basic benchtests you can see that True Basic is very much faster than Amiga Basic

subroutines. Name them with SUB name (param1, param2..) and end them with END SUB. Exactly the same as PROC, especially when you can pass variables to the subroutine.

A variable within a subroutine, or within any section of a program, is local to that particular section. If you want to share values around then you have to pass parameters with your subroutines.

What is particularly interesting is that a subroutine can be internal, or external, saved on a disc. This allows the programmer to build up libraries of useful functions and procedures, save them on disc, and only call upon them when needed, by using a LIBRARY command.

OK, so structured programmers are doubtless feeling pretty smug, having been served up with virtually everything they could ask for. What about the graphics? This after all, is what the Amiga is famous for.

A language that claims to be truly portable surely cannot fully exploit the graphics hardware that is so machine dependent.

Well, True Basic certainly makes a fair old stab at it. Graphics are not related to on a pixel basis, they use a coordinate system of your own definition. Thus a program with graphics on one computer will correspond to the display on another computer, even if the desired effect is reduced.

So before drawing or anything else, you must define your window, in whatever numerical terms you like. For example, your Y coordinates could range from 1945 to 1988, and the program would assign the intermediate values, and the X coordinate could range from 0 to 25. After defining this window, all subsequent graphics commands would then be in terms of these coordinates.

For your money, you can plot points, draw lines, draw and fill a complex shape, flood fill and, strangely, box. The BOX command is used in conjunction with LINES, ELLIPSE, AREA, CLEAR, KEEP and SHOW, and provides those functions inside a rectangle, the size of which you specify.

KEEP and SHOW are the two dark horses of the collection as they are, in fact, blitting commands. KEEP will store part of the display in a string variable while SHOW will splat it back again. Crude animation can be achieved this way.

RATHER surprisingly, given that the other graphic commands are nothing special, there are five special effects commands. With these you can slide a picture, change the scale, rotate it and shear it. When you can call pictures that have been defined just like subroutines, and call them in conjunction with one of the effects commands, you have a very powerful tool indeed.

What it is possible to achieve is in some ways far more impressive than that which The Director, which purports to be a professional display and animation language, can manage.

The system used by True Basic is by no means as easy to get to grips with and produce the desired results without a lot of trial and error. But as a language that makes no attempt to be portable, what can be achieved is far more than you would expect. Even if sprites are not catered for at all.

Should the range of commands not be powerful enough for your needs then True Basic Inc will supply you with a language extension dedicated to just that task. The price is a heavy one. As well as being expensive, bang goes portability.

Sound is the other area that Amiga owners love to crow about, but once again portability and compromise are the order of the day. It is rather disappointing this area, as all you are allowed is PLAY *music$* where the

▶

◀

string contains the musical notation for a tune, and SOUND *frequency, duration*. No envelopes or specific channels to make your sound effects.

Never mind, string handling is superbly done and file handling is treated far more comprehensively with the ability to question files for specific details, as well as the usual byte, data, and program loading and saving functions.

I don't know whether the authors of True Basic anticipate that every computer their language will run on will have a mouse and windows, but these are catered for on the Amiga version. While windows can be made to happen on systems which don't normally use them, reading and using the mouse may prove more difficult to port across.

I asked the question at the beginning of this review as to whether a language whose primarily aim was standardisation and portability would make good use of the Amiga's powerful and individual facilities. Well, the quick answer is: "Not really". But True Basic makes a very valiant attempt in areas that you would not have suspected. It is also surprisingly fast at most things, coefficients excluded.

It's worth noting that it is a good idea to read the reference manual first for the general situation regarding available facilities. And then look through the users guide, in which extra commands, helpful tutorials, and quirks native to the Amiga version are detailed.

For the programmer who will only use an Amiga, True Basic can be seen as a structured, modular and undeniably stylish language that won't help that person get the very best from his computer. For anyone who is interested in portability, standardisation, and working on the Mac and the PC, then True Basic can be seen as a very fine piece of software, and be heartily recommended.

REPORT CARD

True Basic
Precison 01-330 7166
£99.95

USEFULNESS
A good compromise between slow Amiga Basic and difficult to master C.

EASE OF USE
Looks and feels much the same as Amiga Basic but runs very much faster.

INTUITION
As Amigaized as a portable language can be expected. Windows supported.

SPEED
Programs compiled using True Basic run an average of three times faster.

VALUE
Priced a bit high for a home user, really aimed at companies who want to produce products for various machines.

OVERALL 70%

A logical progression for the dedicated Basic programmer. Pricey for the rest.

Amiga Answers

Solve your Amiga anxiety with a letter to Amiga Answers. Our panel of experts is ready to sort out tricky Amiga problems. From machine code to midi, communications to compilers. Whatever your problem our experts are here to help you solve it.

We cannot deal with enquiries personally so please don't send any SAE's. We do need loads of questions. So write to Amiga Answers, Amiga Computing, North House, 78-84 Ongar Road, Brentwood, Essex, CM15 9BG.

Q *Why don't some of my older games work when I have installed extra memory?*

A Some early games will not work with a system which has more than 512k installed. The way to overcome this problem is to select SlowMemLast and NoFastRam from the system drawer of your Workbench disc before clicking on the game icon.

If the game selfboots you will have to remove the ram. Note that fitting a second drive uses up a tiny bit of ram, so a really big game, such as Firepower will only work on a 512k machine if you unplug the second drive.

Q *I have seen some cheap Amiga 1000s advertised and am tempted to buy one in preference to an Amiga 500. I can't see what the advantages of an Amiga 2000 are. Which one should I buy?*

A It depends how much you want to spend. There are some real bargains to be picked up if you shop around for a 1000. Many of these are "grey" imports from France and so will have an azerty keyboard with stickers to turn it into an English qwerty keyboard.

Diehard Amigaists feel that 1000s are visually the nicest Amigas. Commodore has a declared intention to support the machine, although it is no longer made. This means that new Kickstarts will be made available on disc.

But many of the add-ons you will want to buy in the future will come from third party companies. These are unlikely to be readily available in the future. A1000 is very expensive to expand beyond 512k. The A500 is its immediate successor and is easily expandable to 1Mb, with plenty of third party support and altogether a rosier future.

The keyboard is not as nice as that of the A1000, and Kickstart is in rom, which is less flexible but easier to use. Once you want to add more than half a megabyte things start to get expensive, as are hard discs. Commodore has an expansion unit planned, but it is still a way from production.

The A2000 is aimed at businesses. It can be made IBM-compatible, is easily expandable to 9Mb and comes with 1Mb as standard. An unexpanded 2000 is no more useful than an expanded 500.

Which you buy depends on what you want to do. If you just want to play games you could get away with a 1000. Remember that they come with 256k as standard and you will *have* to buy the ram pack. If you don't plan to expand your system straightaway an A500 is the best all round bet. A second disc drive and the 512k ram pack are sensible purchases, but can be left until your bank account has recovered.

An A2000 is only for the rich kid who wants the better keyboard and to add peripherals immediately, or for the businessman who needs the extra ram.

Make sure you get the latest version, which is known as a B2000 because this is faster than an A2000 and has an extra expansion slot.

Q *How can I drag more than one icon at a time? Whenever I select a second icon the first is deselected.*

A Hold down Shift when you click on subsequent icons. You can then do anything with the group of icons that you would otherwise do with one icon. A really useful application for this is to select Clean Up from the menu bar, select all the icons in the window, being careful not to double click, and then select Snapshot.

Q *How can I open a window that covers the whole screen and has no border?*

A The Amiga Basic WINDOW command does not allow windows without borders, but that does not mean that they are not possible. By using the Intuition library routines OpenWindow() and CloseWindow() you can open a window to whatever specification.

```
'Max Height
POKEW Wind&+46,15              (1
for WBench)

WPoint& = OpenWindow&(Wind&)
CALL FreeMem&(Wind&,48)

IF WPoint& = 0 THEN
   PRINT "Failed to open window"
   GOTO Quit
END IF

RastPort& = PEEKL(WPoint&+50)
GOSUB OpenInput
APen& = 1
WHILE INKEY$=""
   CALL
SetAPen&(RastPort&,APen&)
   CALL RectFill&(RastPort&,0,0,
640,256)
   APen& = APen& XOR 1
WEND

Quit:
GOSUB CloseInput
CALL CloseWindow&(WPoint&)
Quit1:
SCREEN CLOSE 1
LIBRARY CLOSE
END

OpenInput:
WINDOW 2,"Input Window",(0,200)
(320,240),1+2,1
RETURN

CloseInput:
WINDOW CLOSE 2
RETURN
```

If you haven't done so already, you will need to create the intuition '.bmap' file.

The input filename is: "Extras:FD1.2/intuition–lib.fd"
The output filename is: "Extras:BasicDemos/intuition.bmap"

AMIGA Letters

Virus problems

I AM a member of a user group and therefore get quite a bit of public domain software. On almost every occasion I find it has the virus. I have two virus killers and a detector which sits in memory and tells you if a virus is present. This is useful because you can find a virus before it spreads.

Is there a virus which can destroy the Amiga's rom? I've been told there is by several sources, including a computer shop. Other people have told me that it is impossible to change the rom, including Commodore repair staff. I've been told that Commodore won't fix the computer under warranty because it said you can only get the virus from pirated software. This means an expensive repair bill.

Now, anybody who has an Amiga will have some PD software and the virus can easily come from this.

D. Cadywold, Darlington.

You cannot damage the computer with a virus. Turn the machine off and on and it will recover. People who claim that the virus can damage a rom do not understand how a rom works – Ed.

Mistakes

I ENJOYED reading issue 1, especially the bit about Workbench 1.3. How much is it anyway? There was an error in the Plain Man's Guide to CLI. The author said that it is important to use capital letters. He is wrong, it doesn't matter whether you use upper or lower case. The Amiga treats it the same.

Now on to the hidden messages. For the last message you omitted to mention that you must hold down the function key while you eject the Workbench disc and replace it with a non-Workbench disc.

Also on the subject of hidden messages do I qualify for a free game with a hidden menu? Hope so. All you have to do is enter the CLI and type: LOADWB –DEBUG. When the Workbench has loaded up the debug menu go to the menu bar and hold the right mouse button.

Move right from the "special" menu and a previously hidden menu will appear. This causes debugging information to be sent down the serial port at 9600 baud. So if you have an RS232 terminal you can tap into it. If this does qualify me for a free game can I have Photon Paint marketed by Activision?

Leszek Wolnik-Kurjanowicz Ealing, W5

Commodore hasn't yet fixed a price for Workbench 1.3. Sorry we don't have any spare copies of Photon Paint. Our review copy was one of the first half dozen Activision had. I'll send you a copy of Jinks instead – Ed

Bare shelves

SOME of my friends bought a copy of your magazine in London, but when I tried to get it in my local shop I couldn't find it on the shelves. It has loads of other computer magazines but not yours. Why?

David Oborne, Swansea

It is always possible that it has sold out. If not it could be because it only stocks magazines which have a record of selling well. Of course with a new magazine there is no way to prove this. If you are in a shop which does not have Amiga Computing *on the shelves you should ask why.*

In a big shop you should ask to speak to the news manager. He will be able to tell you when he expects the next delivery and if it is sold out whether the shop will be getting some more. – Ed.

Write to The Editor, Amiga Computing, First Floor, North House, 78-84 Ongar Road, Brentwood, Essex, CM15 9BG. The best letters each month will be sent a game from our goodie drawer.

Piracy problem

I WAS very interested to read in your first issue about the sales of the Amiga catching up with those of the ST. I work in a shop in London where we sell all kinds of computers, and the Amiga runs second only to Amstrad PCs. But ST software outsells Amiga products. I attribute this to the lack of really good Amiga games and the huge amount of piracy on the Amiga.

Most of the games are straight ST conversions. If I wanted an ST I'd have bought one, but the Amiga has far better graphics and sound. Piracy is a serious problem, and I implore Amiga owners to buy their games and not copy them.

If you have a stolen game which you play a lot, go and buy the original to show the software house how much you appreciate the game.

This is the only way that software houses can be persuaded to carry on supporting the Amiga. One good thing is the bundled software which comes with the ST. Every Atari comes with loads of games, which cuts down the number of new games ST owners will buy, and so makes the Amiga sales look proportionately better.

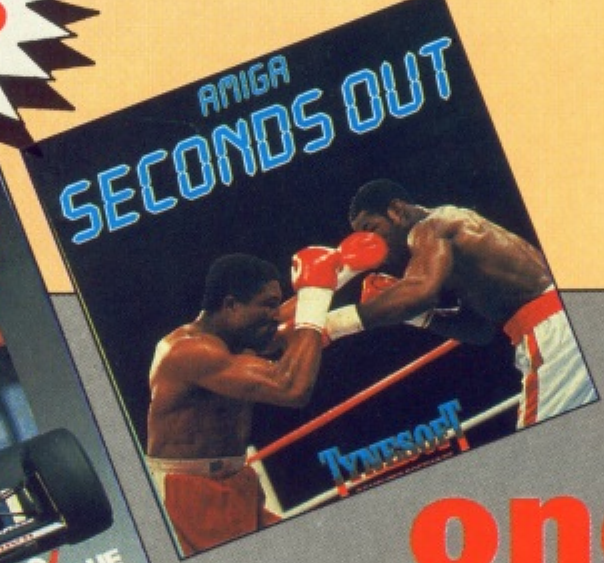
Your first issue was great, keep rooting for world's best computer.

Alex Walsh, Newbury

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All you have to do is buy any one of these other top-selling titles: Seconds Out, Formula I Grand Prix, Winter Olympiad '88 or Stock Market. Then take your from the other two favourites.

To place your order turn to the coupon on Page 85 and select your free game.

Guru's haunt

WHEN a computer crashes it usually locks up, leaving the programmer or user to wonder why that happened. The Amiga is no ordinary computer. It doesn't crash. It Gurus. The black and red screen contains magic information on the state of the computer before it pointed its toes skywards.

The name is due to a bit of Amiga history. When the company was set up it made joysticks for the Atari VCS and Commodore 64. Among these was a tiny stick which you could use with one hand and a huge stick which you stood on. The big joystick was called a joyboard. It was designed for skiing and surfing simulations.

A couple of games were written for the VCS but nothing really came of the joyboard. One program which Amiga did put together was a meditation package. You had to sit on the joyboard and stay as still as possible. The more relaxed, the higher you scored. Although the company has been bought by Commodore and the joyboard is no longer, it is touching to note that it is commemorated by a magic number on every Amiga screen.

● The Commodore logo, the C= symbol, is well known to all Amiga users.

What is less well known is the Commodore in-house name for the logo. To Commodore the C= is the "chickenhead".

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S.D.I.	£29.95	£21.50
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Swooper	£19.95	£16.50
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Title	S.S.P	Our Price
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